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The Gains from Privatization in Transition Economies: Is "Change of Ownership" Enough?

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Executive summary

This paper is the third in a series for USAID that evaluates the first decade of economic reform in transition economies. Based on indicators developed in Sachs, Zinnes, and Eilat (2000, vol. 1), the present paper contributes to the already large literature on transition by seeking to clarify what factors contributed to the gains from privatization in transition economies over the past decade. In doing so, our goal is to point the way to a revised paradigm for privatization policy in transition economies.

We first summarize the paradigm debate and show how the issues of privatization play a central role. We find, as reflected in the original "Washington Consensus", that there has been a tendency to equate change-of-title (COT) with privatization, with the consequence of COT becoming *the* policy imperative. Based on a review of the literature on the gains from privatization, however, we identify the importance of additional factors. These include institutions to address agency (incentive and contracting) issues, hardening budget constraints, market competitiveness (removal of entry barriers), and depolitization of firm objectives as well as the implementation challenge of developing institutions and a regulatory framework to address them. In the present paper, we examine the empirical evidence across 24 countries to determine whether COT alone has been sufficient to achieve economic performance gains or whether these other prerequisites found in the literature (which we refer to as "OBCA" reforms) are important.

We then introduce the key elements of our approach. These include the importance of initial conditions for economic performance, an initial conditions cluster typology of countries, and the significance of the transformational cycle of transition. For our econometric analysis below, we then introduce several indicators, which we developed in Sachs, Zinnes and Eilat (2000, vol. 1), to capture the degree of change of title, agency-related issues, the progress in other reforms, and alternative measures of economic performance.

We then proceed to examine econometrically the central concerns of the paper. We first show that privatization involving change-of-title alone is not enough to generate economic performance improvements. This result is robust to the several alternative measures of economic performance that we utilize including GDP recovery, foreign direct investment, and exports. We then introduce our indicators to capture the reforms directed at prudential regulation, corporate governance, hardening of enterprise budget constraints, management objectives, and developing capital markets. We show that, while these measures on their own contribute to economic performance improvements, the real gains to privatization come from complementing (combining) change-of-title reforms with OBCA reforms. As Pistor (1999b) underscores, it is only when the legal and regulatory institutions supporting ownership are in place and functioning that owners can exercise their prerogatives conferred by a change-of-title to pressure firms to improve their productivity and profitability. Only then will the economic performance of the country improve, too.

We go on to show that these results need to be qualified in two ways. The first relates to when we do not allow for cluster-specific performance responses to policy. Here we find that the higher the level of OBCA, the more positive the economic performance impact from an increase in COT privatization. In particular, where COT has a positive impact, the impact will be even more positive the higher is the level of OBCA; where COT has a negative impact, the impact will be *less* negative the higher is the level of OBCA.

A corollary to this result is that there is a threshold level (provided in the text) of OBCA in order for change-of-title privatization to have a *positive* economic performance response. Thus, if complementary OBCA reforms are not sufficiently developed, change-of-title privatization may have a *negative* performance impact. An explanation for the cases of worsening overall economic performance from COT privatization is that transfer of ownership without the institutional structures in place for owners to exercise their authority simply replaces poor government control of management with weak or no private sector control. We also find that the corollary's obverse is true: an improvement of OBCA does not guarantee economic performance improvements unless a minimum (threshold) level of change-of-title privatization has already been attained. An explanation for this may be that reforms that harden budgets but do not transfer control to private (and, therefore, profit-maximizing) owners may hurt economic performance. Our analysis shows that the threshold COT level for this worrying effect is quite low, with all the countries in the affected clusters well above it by the end of the decade. For both aspects of the corollary, the paper indicates the countries and years that did not exceed these thresholds.

The second qualification relates to when we allow for cluster-specific performance responses to policy changes (but do not allow for the policy synergy effects of the first qualification). We find that economic performance responses from COT privatization are sensitive to the cluster carrying out the policy. The economic performance response to change-of-title privatization was in general significantly positive for the EU Border States and the Baltics, negative for the Western FSU, and ineffectual in the Balkans, the Caucasus, and Central Asia. Increases in OBCA led to performance improvements in the EU Border States, the Baltics, the Caucasus, and Central Asia and led to performance losses in the Western FSU and the Balkans. In short, "one size (policy) does *not* fit all"; privatization policies must be tailored to the (cluster-specific) level of complementary reforms in place.

This paper allows policy makers as well as donor technical assistance providers to draw two main recommendations. First and foremost, they should consider carefully when recommending quick privatization if the requisite OBCA-related, legal, and regulatory institutions are not in place and functioning. As already mentioned, our analysis suggests that there is reason to believe that countries in the Western FSU do not meet these conditions (with the Caucasus and Central Asia borderline). Economic performance gains come only from "deep" privatization, i.e. where change-of-title reforms occur in the presence of high enough levels of OBCA. Second, the idea of "one size fits all", at least from the policy perspective, does *not* apply to transition countries. As a result of different initial conditions, the economic performance responses of countries to the *same* policies are different. In the area of privatization, these responses depend on the level of complementary reforms -- and on OBCA-related reforms in particular. Policy prescriptions, therefore, should be less ideological and more tailored to the country's institutional conditions and stage of transition.

We close by cautioning that our results are hardly definitive. While we have made every effort to use the latest and best data – including a 25-country survey especially conducted for this purpose – the amount of structural change occurring is enormous, the number of observations too few, and the data still too noisy to claim unconditional success. Nevertheless, given that the results are in line with those predicted by agency theory and given that we have utilized a number of alternative economic performance measures and a variety of econometric specifications, we feel that future investigations will broadly support our central conclusions. A new privatization paradigm has emerged: "While ownership matters, institutions matter just as much".

1 Introduction

1.1 Background

This paper is the third in a series resulting from a large policy research project to evaluate the privatization and economic restructuring experience of transition economies that the Harvard Institute for International Development (HIID) carried out for the United States Agency for International Development (USAID). The goal of the study was to make recommendations on how USAID might improve the impact of its assistance to these countries. Of particular concern to USAID was (i) whether the existing reform paradigm needs adjustment and (ii) the role of competitiveness and international integration in achieving sustained economic transition and how donor assistance can support these.

Based on indicators developed in Sachs, Zinnes, and Eilat (2000, vol. 1), the present paper contributes to the already large literature on transition by seeking to clarify what factors contributed to the gains from privatization in transition economies over the past decade. In doing so, our goal is to point the way to a revised paradigm for privatization policy in transition economies.

Section 1 continues by introducing the paradigm debate and showing how the issues of privatization play a central role. It then outlines the elements of our approach, and reviews other relevant empirical literature. Section 2 reviews the theory of the gains from privatization upon which we base our econometric specifications. Section 3 introduces our set of privatization indicators, which make the present study possible. Sections 4 through 6 examine econometrically three central issues of the privatization debate. Section 7 re-examines our econometric results for groups of countries with similar initial conditions. The paper ends with a summary and conclusions.

1.2 A paradigm in flux

It has not been unusual historically, during a time of major economic crisis, for policy makers to base key and often radical actions in a region upon a set of tenets. Sometimes the exact nature and underlying assumptions of the tenets are not even clear until well after the chaotic events. The Twentieth Century had its share of examples, including "The New Economic Program" of Lenin, the "New Deal" of Roosevelt, and the "Marshall Plan" for Europe.

It is fair to say that the first decade of transition to a market economy also has been based on a series of tenets or, as we shall refer to them here, a "paradigm". So well known did this paradigm become that it is often referred to as the "Washington Consensus" since it became the "mantra" of the donor community centered around Washington, DC. Since a description and analysis of this consensus may be found elsewhere (Williamson 1990, 1993, 1997; Kolodko 1997; Aziz and Wescott 1997), we only summarily mention that its key tenets included:

- Fast privatization
- Immediate macro-stabilization
- Quick liberalization
- Sustaining of financial discipline
- Opening of the economy to foreign trade and investment

In the realm of privatization, we may identify a further set of assumptions underlying the paradigm. First and foremost was the idea that the linchpin of transition was to transfer ownership of the firms in the economic sectors to private hands – and to do so as fast as possible. Once

in private hands, a series of self-reinforcing, virtuous though self-interested forces would emerge to demand the creation of all the institutions required for private ownership, thereby locking in the market economy. Moreover, the new shareholder class would demand corporate governance regulation to insure their ability to exert oversight on enterprise managers.

The short shrift that the Consensus gave to the institution – not to mention the implementation – dimension of privatization extended to the other transition policy prescriptions of the Consensus. For example, the prescription to open the economy to the foreign sector was based on a belief that this would lead to investor protection regulation. This, they believed, would occur due to pressure on governments from the newly established foreign investors or in order to attract foreign investors in the first place.

These tenets have led to a debate of greater and greater vehemence over the decade (Balcerowicz 1993; Nellis 1999; Dabrowski 1996; Stiglitz 1998), even while the obsessions with macro stabilization, privatization, and structural adjustment have given way to a fourth ingredient: systemic transformation (Aslund 1994; Kornai 1994; Sachs 1996). Now that a decade has passed, enough data has become available to examine these concerns by posing a set of tractable questions, which we then analyze in this paper. In particular, has privatization led to better economic performance and, if so, under what conditions? Are there pre-conditions or are complementary reforms necessary in order for privatization to generate gains in economic performance?

A common though implicit thread underlying these questions is the degree to which supporting institutions are necessary in order to achieve the full gains from privatization (Pistor 1999a). Such institutions might include *inter alia* those responsible for shareholder protection, banking adequacy, creditor protection and bankruptcy courts, capital market supervision, and commercial code enforcement. In the present paper, we focus on the supporting role institutions have in bringing out the full potential of privatization. We argue that policy makers should pursue "deep privatization", i.e. both change-of-title reform and a strengthening of supporting institutions.

1.3 Overview of approach

While Sachs, Zinnes and Eilat (2000; vol. 1) provide a full description of the framework employed in the HIID project, we summarize here its key elements.

The first element of our framework is a heuristic model of cause and effect. This is illustrated in Figure 1. While the components of this figure are discussed in greater detail in the sections below, we note for now that the framework comprises several blocks:

- initial conditions at the onset of transition (economic, social, demographic, geographic and cultural characteristics, which may be either fixed or variable in time);
- policies (including legislation) and institution-building undertaken during transition;
- economic performance;
- donor assistance received; and
- other idiosyncratic shocks (e.g., war).

The figure also underscores the importance given to initial conditions. We are certainly not the first to focus on a separation between initial conditions and policy, examples being Sachs (1997a), de Melo *et. al.* (1995), and Havrylyshyn *et. al.* (1998; 1999). As far as we are aware, however, we are the only ones to apply the distinction analytically to privatization and to examine the direct effect of initial conditions on policy responses, as the discussion of element two will confirm.

Unlike other work examining institutional factors contributing to economic performance (see Knack and Keefer 1995) our approach does not take as its starting point the by-now standard "new" growth theory paradigm as described in Barro and Sala-i-Martin (1992), Mankiw, Romer and Weil (1992). This is because – and this is a common theme in our work – the fundamental challenge and therefore dynamics of transition economies is one of systemic transformation, not growth.[1]

The second element of our framework is the use of an initial conditions cluster typology. While the 25 countries in our sample appear to exhibit a large variety of transition experiences, in fact, mostly because of common geographical, historical, and resource patterns, there are significant similarities. Building on this insight, in Sachs, Zinnes, and Eilat (2000, vol. 1) we assign countries to groups based on similarities in their initial conditions at the start of transition in a way that minimizes within-cluster country differences and maximizes across-cluster country differences.[2] We identify representative variables that describe the initial conditions based on economic theory and what is relevant for a country's prospects of transition performance. By considering groups or "clusters" of countries based on their "initial conditions", the cluster approach allows us to identify the underlying issues in a way more parsimonious than 25 individual country assessments.[3] Most importantly, however, through the use of fixed *as well as* interaction effects, the cluster approach permits a more controlled basis for comparing "successful" and "failed" policies implemented during transition, and thereby offers a way to assess policy effectiveness. Applying the methods articulated in our companion paper resulted in seven clusters of transition countries, as listed in Table 1.[4]

Table 1: Summary of the initial conditions-based typology

Cluster name	Country membership
EU-border states	Croatia, Czech Republic, Hungary, Poland, Slovakia, Slovenia
The Balkans	Bulgaria, Macedonia, Romania
The Baltics	Estonia, Latvia, Lithuania
Albania*	Albania
Western FSU	Belarus, Moldova, Russia, Ukraine
Caucasus	Armenia, Azerbaijan, Georgia
Central Asia	Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan

*Not used in the ensuing analyses, as explained in the text

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[1] Havrylyshyn and van Rooden (1999) also follow the same orientation as we do.

[2] Categories of initial conditions include: physical geography, macroeconomics, demographics and health, trade and trade orientation, infrastructure, industrialization, wealth, human capital, market memory, physical capital, culture, political situation.

[3] Regression analysis using clusters also helps to overcome the degrees of freedom "problems" experienced in other work (e.g., Havrylyshyn *et. al.* 1998) where individual country dummies are used instead.

[4] While Sachs, Zinnes and Eilat (2000; vol.1) include Albania, we have dropped it from the analysis in the present paper due to lack of data for a number of key variables.

Figure 1: A framework to evaluate transition
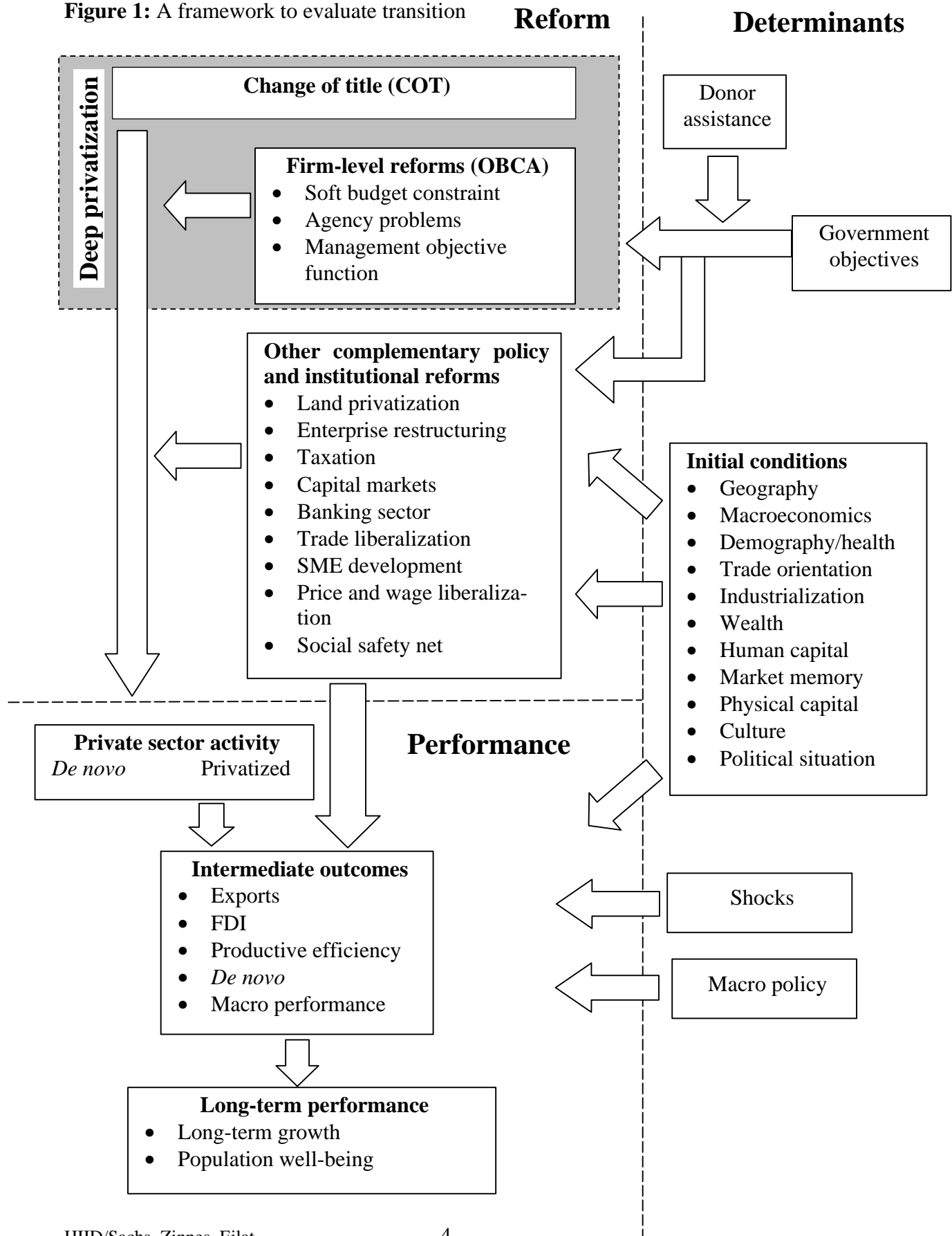
While our approach has been to focus on a cluster typology based on the initial conditions of transition, other observers have used, to a greater or lesser extent, a cluster-oriented approach based on other factors. Groupings of countries is a common feature of many of the EBRD Transition Reports. Others have sought to classify transition countries over the transition period in terms of their economic performance (Dabrowski 1996). Finally, as mentioned above, in their influential paper, de Melo *et. al.* (1995) also emphasize initial conditions but do so by "clustering" initial condition *variables*, not countries.[5]

A third element of our approach is that in the time domain, what counts is time elapsed since transition and not calendar time. Our hypothesis (based on Sachs 1996 and Kornai 1994 discussed above) is that each country, regardless of the actual calendar date, passed through a sequence of recessions, typically first from macro-stabilization and then from restructuring. We capture these in our regressions through the use of transition year dummy variables for each year of transition[6]. We also use several dummy variables to take explicit account of the effects of macro-stabilization on economic performance (Sachs 1997b).

Before turning to the theoretical literature below, let us briefly review the empirical literature on the impact of privatization on economic performance, much of it inspired by Boardman and Vining (1989) and Megginson *et. al.* (1994) whose work is in the non-transition country context. It is of two types, case studies of a small sample of firms (Earle *et. al.* 1993) and cross-industry econometric studies, either country-specific (Barberis *et. al.* 1996) or multi-country (Frydman *et. al.* 1998; Pohl *et. al.* 1997). The econometric studies either look at enterprise performance before and after privatization or compare the performance of privatized and state-owned firms within given sectors. Based on either firm-level surveys or data on publicly traded firms, these studies are essentially microeconomic in nature and primarily analyze the effects on labor productivity, level of employment, enterprise revenues, and sometimes even profitability (Djankov and Pohl 1998). These studies find privatization to have positive effects across these measures.[7] With the exception of Claessens and Djankov (1998),[8] this literature does not econometrically examine the contribution of the legal or institutional regime to enterprise performance.

While these studies are quite revealing, they can only provide a partial picture, mainly because even the largest of them covers only seven countries; there are currently 25 transition economies, however. The focus is typically on the EU Border States and none econometrically analyzes both CEE and FSU countries. Part of the reason for this is the high cost of survey data collection in so many countries. Even where such firm-specific data exist it is hard to analyze, since little uniformity or consensus exists regarding the way to define, classify, collect, or treat such data, especially in the case of transition.

A natural, if imperfect alternative to complement the firm-level studies would be to consider macroeconomic econometric evidence. A healthy literature does exist on the determinants

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[5] In fact they are not really "clustering" variables but aggregating or summarizing them using their first and second principal components. They do point out in passing how countries, when plotted against their 2 principal components, appear to form groupings.

[6] For example, the dummy variable for the 3rd year of transition will be equal to one for Poland in 1992 (started transition in 1990) and equal to zero for Poland in all other years, it will be equal to 1 for Russia in 1994 (started transition in 1992), and equal to zero for Russia in all other years and so on. For a complete list of years when transition began see Annex 2.

[7] See Havrylyshyn and McGettigan (1998) for a summary.

[8] Controlling for institutional differences, they test several propositions of Shleifer and Vishny (1994) regarding how privatization and stabilization (hard budget constraints) affect firm behavior.

of transition paths (de Melo *et. al.* 1995; Fischer *et. al.* 1996, Havrylyshyn, Izvorski and van Rooden 1998), often with real GDP growth as an explanatory variable. Sheshinski and López-Calva (1999), however, indicate that little macroeconomic econometric evidence exists on the effects of privatization. It is precisely this gap that we aim to redress in the present paper. The key step was to adopt the indicator methodology of Sachs, Zinnes, and Eilat (2000, vol. 1), the fourth and final element of our framework. This element of our approach is predicated on the assumption that economic concepts can be captured – especially when data are poor or intermittent – by aggregating several imperfectly reported data series so as to put the law of large numbers to work.[9] The questions analyzed below could not have been investigated in a systematic way for 25 transition economies without the creation of these indicators.

2   The theory of privatization gains

While Havrylyshyn and McGettigan (1998) point out that there is no general theory of transition, we may point to several elements that such a theory would contain. One would be that the "transformational recession" that accompanies transition requires a *reorientation* from a seller's to a buyer's market and the imposition of a hard budget constraint on producers to succeed (Kornai 1994). At the same time, transition requires the *reallocation* of resources from the old to the new activities through the closure of inefficient state enterprises and the establishment of new firms in the private sector, as well as the *restructuring* of those firms that survive (Blanchard 1997). Clearly, privatization figures prominently as a policy to accomplish these changes. As stressed by Sheshinski and López-Calva (1999), there are both microeconomic and macroeconomic rationales to engage in privatization.

On the micro front, these include the potential for greater allocative and productive efficiency and promotion of a stronger role for the private sector. There seems to be a consensus that in order to achieve sustained economic growth in a transition economy, productive efficiency is the key (Havrylyshyn and McGettigan 1998). Far less agreement exists on whether a quick rush into privatization is the best way to proceed. There are two aspects to this argument. The first is related to the age-old question of why ownership matters. The second is one of implementation: When is the best time to privatize, given that the full gains from privatization may require complementary reforms and the development of key institutions? Let us consider each in turn.

While the empirical work in the present paper is at the macro level, we base our model specification on a theoretical framework that stems from some of the core results of the vast microeconomic literature which has emerged over the years. With excellent surveys already available (e.g., Havrylyshyn and McGettigan 1998; Sheshinski and López-Calva 1999), we only highlight here those aspects pertinent to the motivation of our theoretical framework.

One result of the microeconomics literature (Sappington and Stiglitz 1987; Shapiro and Willig 1990) is that under perfect competition, perfect information, and complete contracting, publicly owned and privately owned firms would have the same level of performance, i.e. ownership structure does not matter. Historically, supporters of public ownership have been quick to justify their view by pointing out that market failures, such as the existence of natural monopoly, lead to efficiency (social) losses and therefore scope for state intervention. Those supporting private ownership focused on the existence of information asymmetries and the problem of incomplete contracting, leading to severe incentive problems and therefore serious efficiency losses to public ownership. Moreover, the move toward open economies as well as

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[9] Sachs, Zinnes and Eilat (2000; vol. 1) contains a detailed description of our indicator methodology.

advances in the theory and practice of regulation (Laffont 1993) have reduced the concerns about monopoly.

The incentive-efficiency link has been called the agency problem and has two threads. The managerial view (Vickers and Yarrow 1990) concerns the inability of the state to monitor enterprise managers. This inability stems from the lack of a market to price and instill discipline on firms through the threat of take-over or bankruptcy. The political view (Shapiro and Willig 1990; Shleifer and Vishny 1994, 1996) concerns the temptation of political interference to distort manager objectives away from profit maximization and toward others such as employment maximization. Moreover, this interference can also result in the perception among firm managers of a "soft" budget constraint (Kornai 1986), in which they expect *ex post* subsidies or write-offs to cover enterprise losses due to production inefficiencies.

What this brief review points to is that the gains from privatization (change of ownership, referred to below as "COT") will likely depend on how a country's legal, regulatory, and institutional environment addresses agency-related issues. For the purposes of the empirical work below, we classify these issues into three types. The first relates to the firm's objective (O) function and how close it reflects profit maximization. The second relates to the hardness of the firm's budget constraint (BC). The third relates to the legal and institutional framework through which firm owners are able to monitor and control enterprise managers, the so-called principal-agent (A) problem. For simplicity we combine the letters in parentheses to name this class of issues "OBCA".

On the issue of the implementation of privatization, Havrylyshyn and McGettigan (1998) identify two schools of thought. The first stresses the importance of the competitive environment and market structure over ownership (Nellis 1999). For transition economies, the creation of a competitive environment would occur through the hardening of enterprise budget constraints, rather than a rush into privatization. This was thought to occur, according to Frydman *et. al.* (1997), as a result of pressures from macroeconomic stabilization on firms to restructure or go out of business. The second stresses the need for a headlong rush into privatization, though the need to *eventually* follow up with the development of supporting institutions was sometimes noted. Both these views underscore the insights from the preceding discussion regarding the importance of the hardness of the firms' budget constraint, as well as the likely importance of establishing a multitude of market institutions.

Finally, we want to remark briefly on the theory of macroeconomic gains from privatization, though this literature is much less developed (Blanchard 1997). The main conclusions here are that privatization can lead to better financial health of the public sector and can free up state budgetary resources for other key areas of government activity. This literature carries a number of implications for our work.

First, it suggests that gains from privatization at the level of macroeconomic performance depend on complementary policies – and not just those related to appropriate institutions, as we described above (Aziz and Wescott 1997). Consider some examples. While on the expenditure side, the ending of subsidies has a positive impact on state finances; and on the revenue side, the state will lose its share from the previously profitable enterprises unless an adequate tax code and administration is established. The potential for efficiency gains from privatization and resource reallocation also depends on the creation of a price system that responds to relative scarcity on both the (factor) input and output sides. Thus, the gains from privatization will depend on the extent of price and wage liberalization. Unless privatization is accompanied by an opening of the capital and current accounts, the newly privatized domestic firms may not be able to gain access

to foreign skills, markets, and financing necessary for their success. Moreover, without entry by foreign firms, some economic sectors will remain without competition as newly privatized state firms retain their dominant position. Since large state enterprises and the way they are financed distorts and tends to crowd out private investors, privatization tends to have a positive impact on the development of financial markets. This effect is strengthened if privatization occurs through public offerings. Finally, since many of the biggest state firms were involved in infrastructure-related activities, privatization gains for these sectors will depend on the success of deregulation policy.

Second, privatization may have opposite short-term and long-term economic performance impacts (Aghion and Blanchard 1993; Roland 1994). For example, unemployment may increase over and above what would be expected from the resource reallocation associated with enterprise restructuring suggested by the microeconomic perspective. This may occur to the extent that privatization leads to employment shedding as managers are freed from political interference and are able to return to profit maximization as their principal objective.

3   Patterns of transition

To investigate the central questions raised at the end of section 1.2, we take advantage of a unique panel data set of indicators for the period 1990 through 1998 developed in Sachs, Zinnes and Eilat (2000, vol. 1). We refer to these below as the SZE indicators. Among these include a series of indicators representing the components of the depth of privatization and of the progress in transition. In this section, we summarize how these measures were constructed and how they behaved over the transition period. We also introduce the three macroeconomic measures we use for country performance. All indicators are scaled to have a mean of zero and a variance of unity across the 25 countries and years 1990-1998 of transition.

The SZE indicators were constructed using two types of sources. We first used virtually all published data sources available at the time for which observations existed for the entire sample of transition countries. (Thus, if a series were available only for one cluster e.g., only for the EU Border States, it was not included). Second, we developed and administered a 100-question survey to research institutes in all 25 transition countries. The scope of the survey was to augment published sources with data sources not reported by international collection agencies and with category and binary variables to capture expert opinion on microeconomic variables.[10] Nevertheless, poor coverage remained for Albania for key variables pertinent to the analysis in later sections of this paper, forcing us to drop Albania from our sample.

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[10] Examples of survey questions include: (i) "What is the corporate income tax rate?"; (ii) "Is a government-owned firm the dominant firm in the insurance sector?"; and (iii) "How many major-owned foreign firms are in the banking sector?". Note these questions are different from executive surveys, which ask such questions as: "To what degree are regulations restrictive to business?".

Figure 2: Inter- and intra-cluster variation of "change of title" indicator of privatization over the transition cycle and for 1998, respectively. *Source:* Sachs, Zinnes and Eilat (2000, vol. 1).
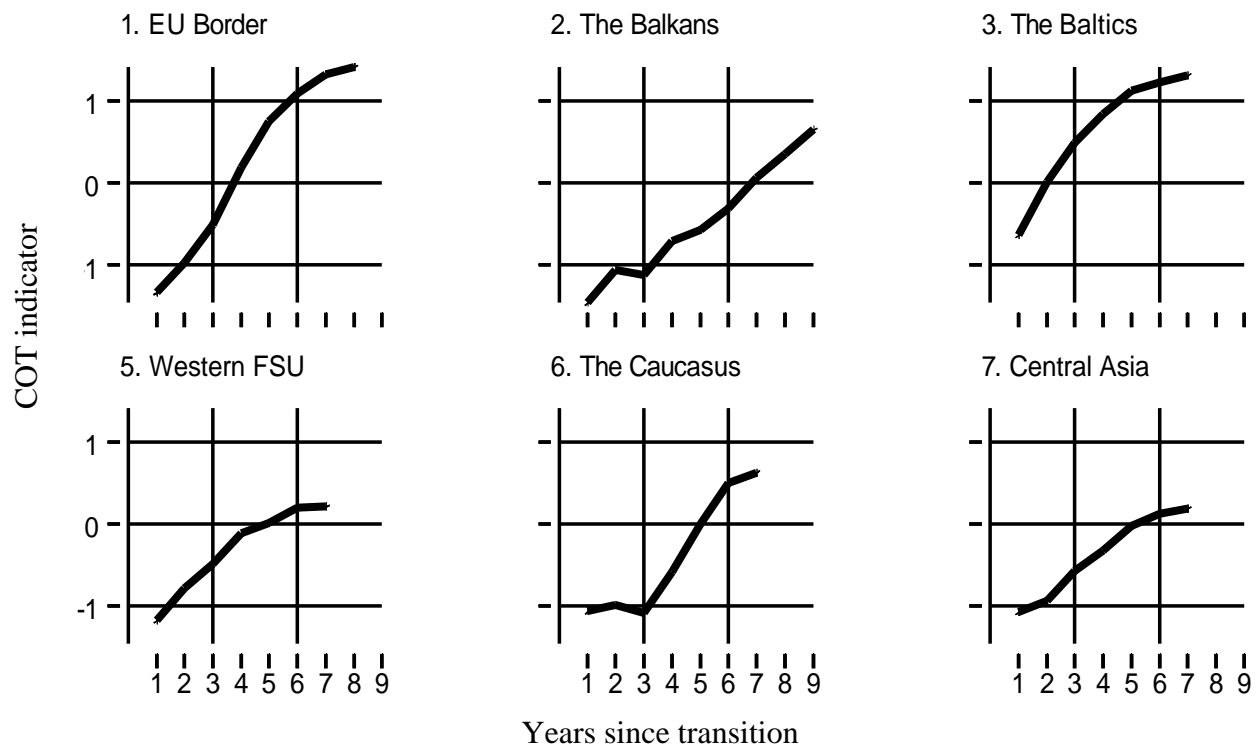
(Notes: Macedonia was excluded from the Balkans for the figure above due to lack of data on COT for first years of transition. See annex 2 for graph details, including definitions, symbols and data exclusions.)
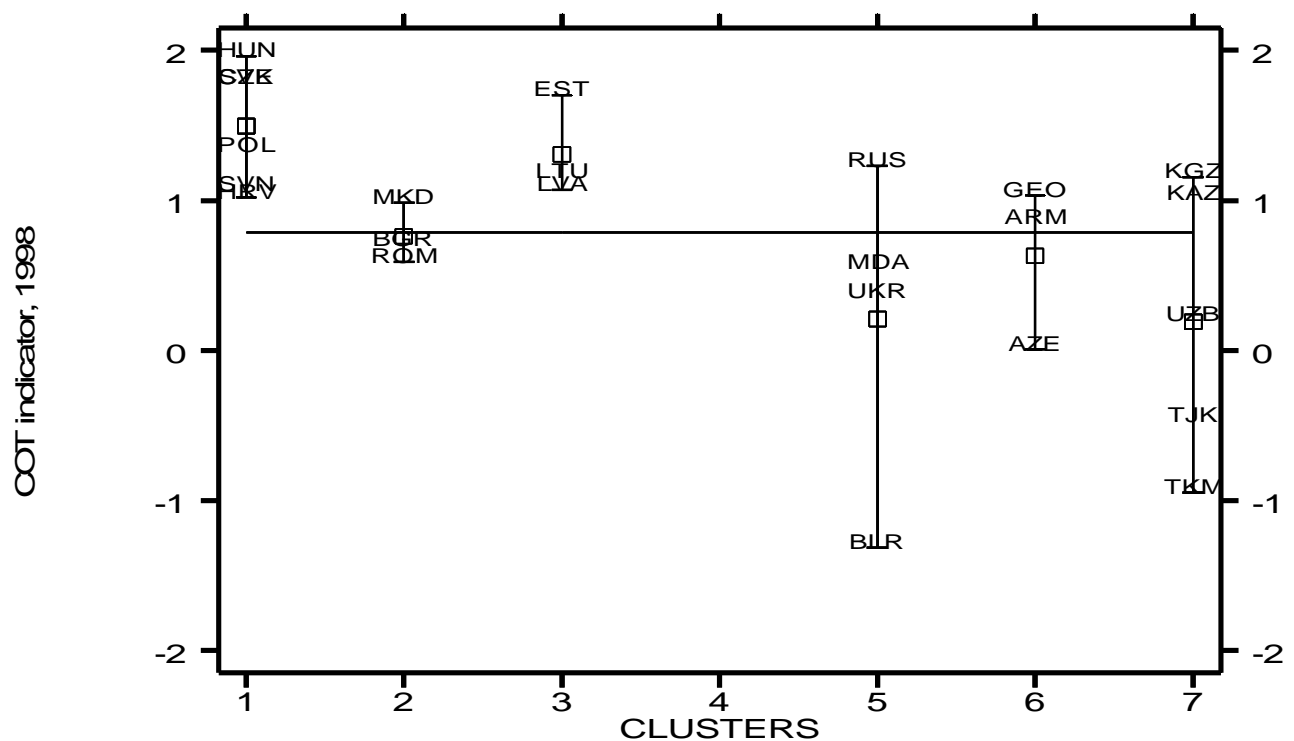
Figure 3: Inter- and intra-cluster variation of "OBCA" (firm incentives) indicator of privatization over the transition cycle and for 1998, respectively. *Source*: Sachs, Zinnes and Eilat (2000, vol. 1).
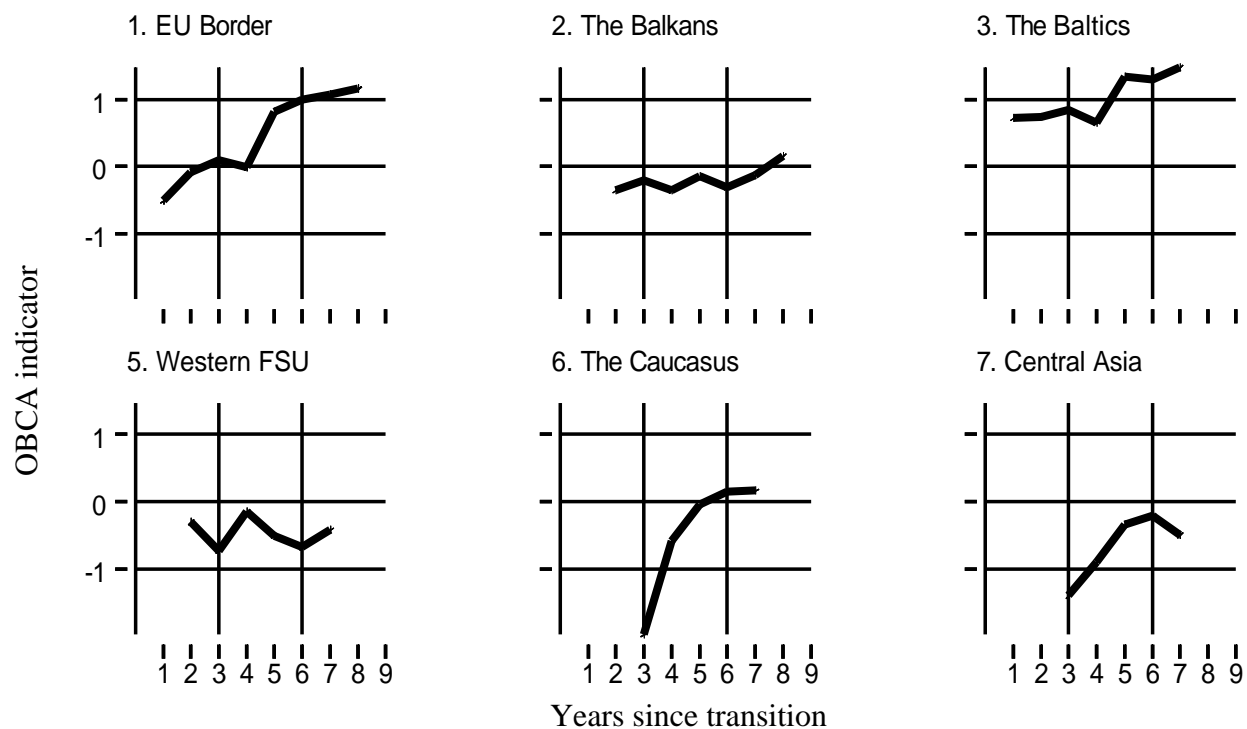
(See annex 2 for graph details, including definitions, symbols and data exclusions.)
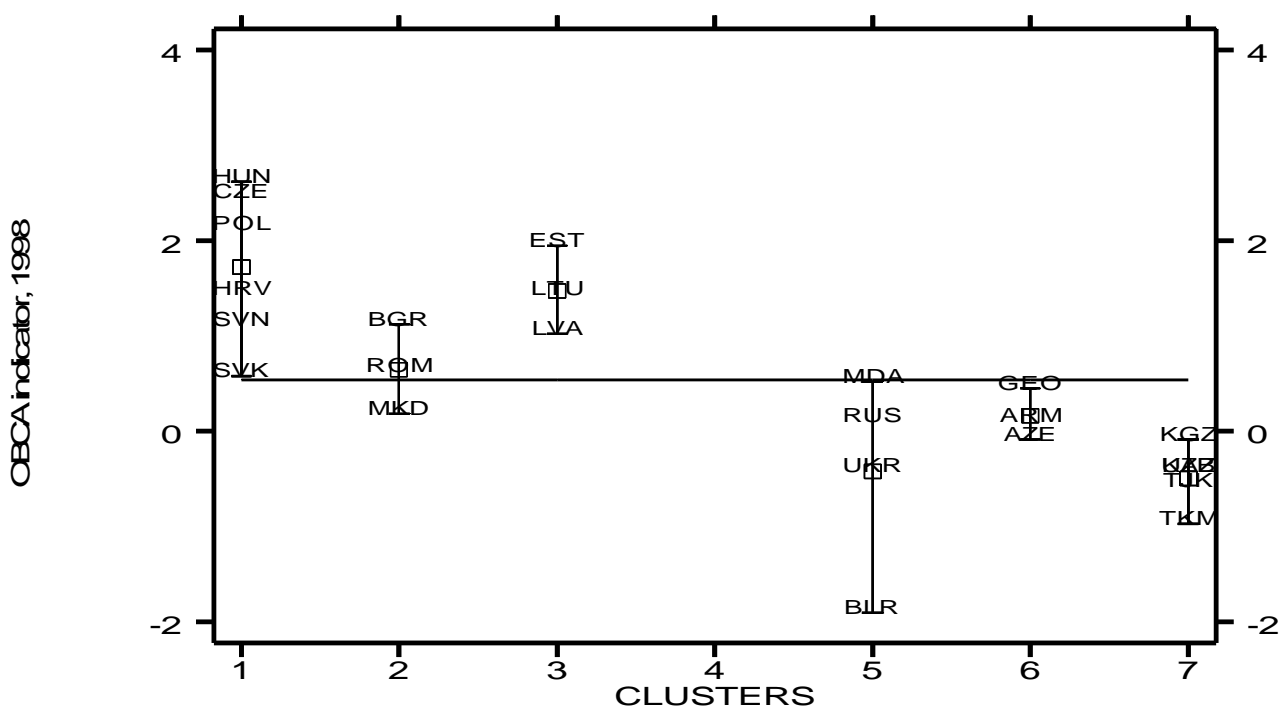
3.1 Patterns of privatization over the transition period

In order to capture the depth of privatization, we follow the theoretical framework presented above and break "depth" into two major components. The first we call COT (change of title). This indicator includes the EBRD large-scale and small-scale privatization indices, the private sector share of GDP, the percentage of state firms privatized, and the private sector share of employment. The second we call OBCA. It aims to capture the firm management objectives, the hardness of its budget constraint, and the quality of corporate governance regulation. The indicator includes the share of tax arrears in GDP, the ratio of budget subsidies to average GDP over the period, the share of bad loans to total loans, the electricity tariff collection ratio, the likelihood of a government bail-out of a mid-sized private sector firm, the existence of bankruptcy courts, and the EBRD restructuring and legal system indices. [11]

Figure 2 presents the progress in change-of-title privatization over the transition cycle by cluster. First note that all the clusters display an upward trend on this measure. Next note that the trend shows strong signs of reaching an asymptote, especially for the best performers. This is to be expected since there is a natural upper bound to this indicator (i.e., you can't privatize more than the whole economy). We see that only the Baltics and the EU Border States achieve well above (more than one standard deviation above) average results. The Western FSU and Central Asia after improvements in the first half of the transition period seem to plateau at the sample average. The Balkans and the Caucasus are the opposite: after little initial improvement, they take off. The bottom panel of Figure 2 contains the within-cluster variation for 1998. The horizontal line represents the sample average for 1998 while the "squares" indicate the 1998 average for the cluster. Here we find reasonably tight clusters, with the exception of Western FSU and Central Asia. Unsurprisingly, Belarus shows little activity in this regard. The Kyrgyz Republic and Kazakhstan sub-group in Central Asia is typical of all the reform indicators for this group. Azerbaijan's lagging policy for its cluster is in stark contrast to its exceptional level of foreign direct investment.

Turning to OBCA reforms, a very different picture emerges, as we show in Figure 3. Here, the Caucasus shows a strong upward trend improvement in these reforms while the Western FSU, the Balkans and, ultimately, Central Asia have remained stagnant. Of course, the Caucasus, Central Asia, and the Balkans start from a very low point. The Baltics, on the other hand, start from a very favorable initial position and make limited progress. The lower panel containing within-cluster variation for 1998 shows Belarus, again, as the worst performer. Note how the EU Border States have bifurcated into two sub-groups, with the "new" states together and lower.

3.2 Patterns of reforms over the transition period

Since we will be examining the impact of reforms related to privatization, it will prove important to have indicators of the other reforms underway. There are two reasons for this. First, we want to ensure that our privatization variables do not proxy for other reforms. Second, we will need indicators of other key reforms in order to assess their complementary effects on privatization.

Our aggregate reform indicator (REF) comprises several components.[12] The social safety net component captures three aspects of the government's attempt to soften the negative social

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[11] See Annex 2, table 11, for details.
[12] For details of the exact "recipes" for these indicators, see Sachs, Zinnes and Eilat (2000, vol. 1), chapter 5.

impacts of transition: unemployment, plant closure or worker redundancy (retraining and sever-ance payments), retirement (income support). Price liberalization comprises not just goods and service prices but also wages and the degree of competition in the price formation process itself. The capital markets indicator comprises sub-indicators for the stock market, securities market, and the non-bank financial institutions. Tax reform includes not just improvements in the tax code but also in its administration. Thus, this indicator includes components for the quality of tax collection efforts and the sophistication of the tax system. By sophistication, we refer to whether modern low-distortionary revenue instruments are in place, as opposed to such instruments as trade-distorting import tariffs and export taxes. The banking sector indicator focuses on the degree of competition in the sector and the degree the sector is providing economic agents with adequate credit and services. The land reform sub-indicator concentrates on measuring the degree that land markets function in a way consistent with the needs of a market economy (e.g. tradability and foreign ownership restrictions).

Figure 4 presents a summary of overall progress in transition across the various clusters as well as for their current position. Clearly, all the clusters have exhibited progress in their reform agendas. The EU Border States and the Baltics achieve the greatest degree of progress, with the former showing the greatest absolute improvement over the period. The Western FSU, though, not only ran out of steam by the sixth year of transition, but it even started to back-peddle. Turning to the 1998 within-cluster differences, the Baltics and the Caucasus are especially tight. Moldova shines in the Western FSU. The EU Border States have clearly bifurcated, with the "new" states doing the least well in the cluster. Central Asia is also bifurcated with Kazakhstan and the Kyrgyz Republic well above the rest of the cluster.

Figure 5 presents the inter- and intra-cluster variation for capital market reform. Here, the Western FSU, pulled by Russia, exhibit an impressive performance, approaching the levels of the Baltics and the EU Border States, the sample's best performers. In fact, Central Asia, the Caucasus and the Balkans all show unabated though bumpy improvements in this reform category. Note how all clusters, with the slight exception of the Baltics, begin transition at the same starting point. Oddly, in spite of such positive improvements over the period, the clusters are no tighter than in the case of the other reforms. In the case of the EU Border States, we see the, by-now, usual occurrence of countries bifurcating themselves into "old" states and "new" states. The Central Asia cluster also bifurcates into polar extremes, with Kazakhstan and the Kyrgyz Republic showing above-average performance. Finally, for their respective clusters, Romania and Georgia show very good and very bad capital market performance by 1998.

Figure 4: Inter- and intra-cluster differences in overall progress in reforms over the transition period and for 1998, respectively. *Source:* Sachs, Zinnes and Eilat (2000, vol. 1).
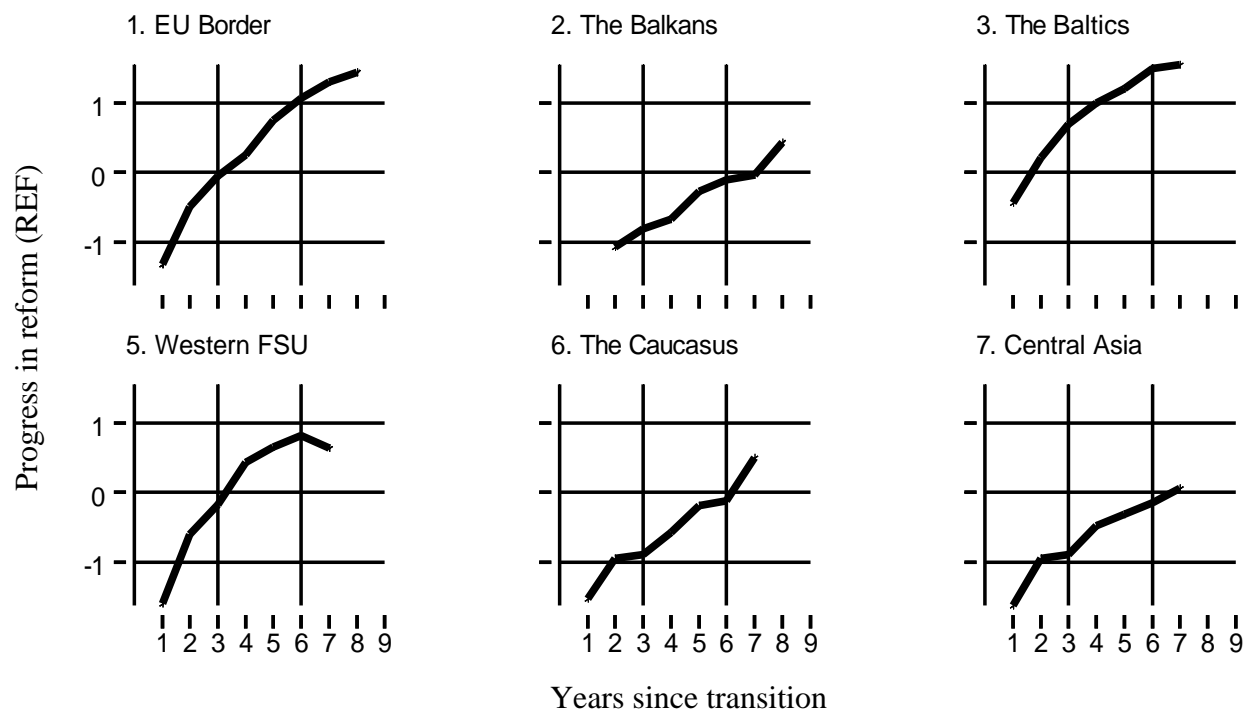
(See annex 2 for graph details, including definitions, symbols, and data exclusions.)

Figure 5: Capital market reform inter- and intra-cluster variation for the transition period and 1998, respectively. *Source:* WDI and Sachs, Zinnes and Eilat (2000, vol. 1).

(See annex 2 for graph details, including definitions, symbols, and data exclusions.)
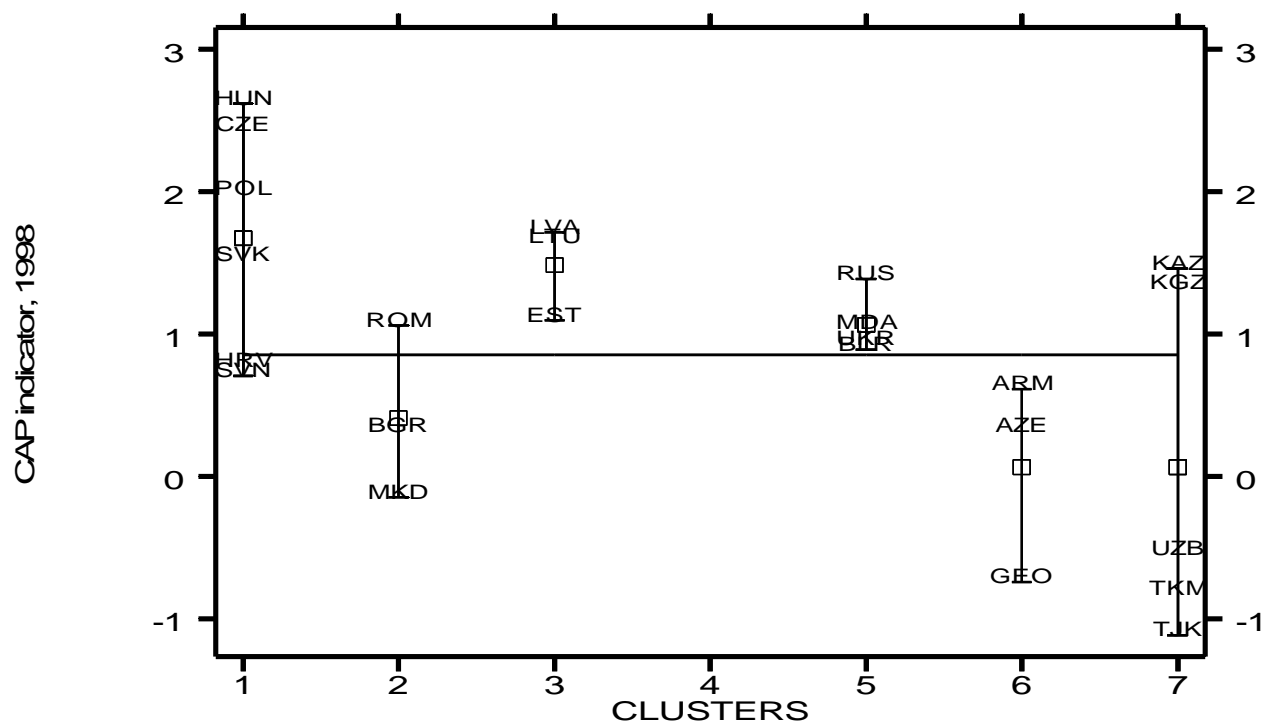
3.3 Patterns of performance over the transition period

While it is important to have a well articulated set of inputs to the reform process (so-called "right-hand-side" variables), it is equally important to have measures of performance (so-called "left-hand side variables"). This has been somewhat problematic due to the standard issues related to data quality in the field of transition economies. For the present analysis, we have chosen three measures of performance with the hope that together they provide a more objective picture of the forces we examine. These include real gross domestic product per capita, foreign direct investment, and exports.

The first economic performance measure summarizes domestic output.[13] Using GDP growth rates from EBRD (1999, p. 73), we construct an index of real GDP relative to 1989 so that the value for each country is 100 in 1989 (not in our sample). The index therefore indicates the degree of economic recovery by showing the percent of pre-transition output attained in a given year. This approach facilitates the comparison of the performance across countries with vastly different per capita figures. We call the variable IGDP.

Figure 6 presents the inter- and intra-cluster variation of IGDP for the sample of transition countries. The top panel clearly illustrates the by-now familiar patterns of the traumas of transition, of which there appear to be two. The EU Border States and Baltics typify the U-shaped turnaround some countries have been lucky enough to experience. The Western FSU and Central Asia typify a steady, apparently irreversible decline. The Balkans and Caucasus fall in between. The second panel with within-cluster variation for 1998 reveals tight clusters for the Balkans, Baltics, and Caucasus. Poland is the best performer. While Uzbekistan and Belarus appear to do "well", this is a deceptive since it is only true in the sense that, having done the least reform, they are closest to where they began.

The second economic performance measure is an indicator of foreign revealed preference on the quality of a country's environment for economic activity. Here we construct two related measures. The first, FDIpop, has as its numerator the foreign direct investment series and as its denominator, total population, both from EBRD (1999). The second, FDIrel, has the same numerator but uses pre-transition GDP in 1989 at purchasing-power-parity (from de Melo *et. al.* 1995) as the denominator. We deflate by population and by 1989 GDP to provide two perspectives on what might be comparable indicators of foreign investor activity across countries. As shown in Table 2, FDIrel and FDIpop are very highly correlated. The inter-cluster variation for these two indicators is shown in the two panels of Figure 7.[14] As expected from investment data, these graphs show more volatility than the others of this section. With the exception of the Caucasus, these two related performance measures communicate the same story. The star performers are the EU Border States and the Baltics, this time with the latter being the best. Both clusters also show a mid-trajectory leveling off before taking off again. The Caucasus also exhibits a secular albeit less spectacular increase, the size of which depends on the FDI measure. The Western FSU and Central Asia show little increase in FDI over the period. Finally, by the end of the transition period, the Balkans seems to be generating some investor interest.

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[13] We have not made any corrections, such as those proposed in Johnson, Kaufmann and Shleifer (1997), for the unofficial economy. IGDP, based on official statistics, may therefore understate economic performance. The bias may also vary across countries. This is yet another reason why we use several alternative measures of economic performance.

[14] Note that due to its extreme outlier behavior relative to its economy's size, Azerbaijan is dropped from FDIrel but not FDIpop.

The last economic performance measure refers to exports (as reported by the balance of payments statistics) and proxies a country's international competitiveness. This has been deflated by GDP in 1989 (again, de Melo *et. al.* 1995). We call the variable EXPrel. Figure 8 presents the inter- and intra-cluster variation of this variable for the sample of transition countries. Here, the EU Border States and the Baltics show the longest sustained increases in exports, though the former at a much higher level. The Western FSU, the Caucasus, and Central Asia are all at very low levels and show no inclination of increasing. The Balkans, whose initial levels were between the Baltics and the EU Border States, exhibits a protracted though lethargic increased trend.

While each of these is a highly imperfect measure of a country's true economic performance, our hope is that, taken together, they provide a more realistic window into what is actually happening than one alone.

For completeness, Table 2 provides the correlations between the policy and performance variables constructed above. The top-left block shows that performance variables among themselves are only moderately correlated, with IGDP most correlated to exports. As the bottom-left block shows, there is only weak positive correlation between policies and performance, with IGDP the most correlated to OBCA of the policy variables. The export and FDI variables are more correlated to policies than is GDP. Turning to the bottom-right block, we see that REF is quite correlated with the other policy variables, and especially to CAP.[15] This suggests that REF would be a good proxy for the general level of policy reform progress. We will come back to these points when discussing the potential for multi-collinearity in our main regressions, below.

Table 2: Correlations between policy variables and performance over the transition period for all countries. *Source:* Authors' calculations*.

	IGDP	FDIrel	FDIpop	EXPrel	COT	REF	OBCA	CAP
IGDP	1.00							
FDIrel	0.33	1.00						
FDIpop	0.35	0.97	1.00					
EXPrel	0.62	0.39	0.46	1.00				
COT	0.20	0.40	0.41	0.33	1.00			
REF	0.28	0.47	0.50	0.41	0.78	1.00		
OBCA	0.40	0.43	0.47	0.45	0.59	0.64	1.00	
CAP	0.28	0.42	0.43	0.37	0.70	0.85	0.45	1.00

* See Annex 2 for variable definitions.

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[15] This is not surprising since REF includes CAP. In the regressions below, therefore, we do not use REF and CAP together; we use CAP with REFmK, which contains all the reforms in REF except CAP.

Figure 6: Inter- and intra-cluster variation of real GDP per capita relative to 1989 (IGDP), both over the transition period and for 1998, respectively. *Source*: Sachs, Zinnes and Eilat (2000, vol. 1).
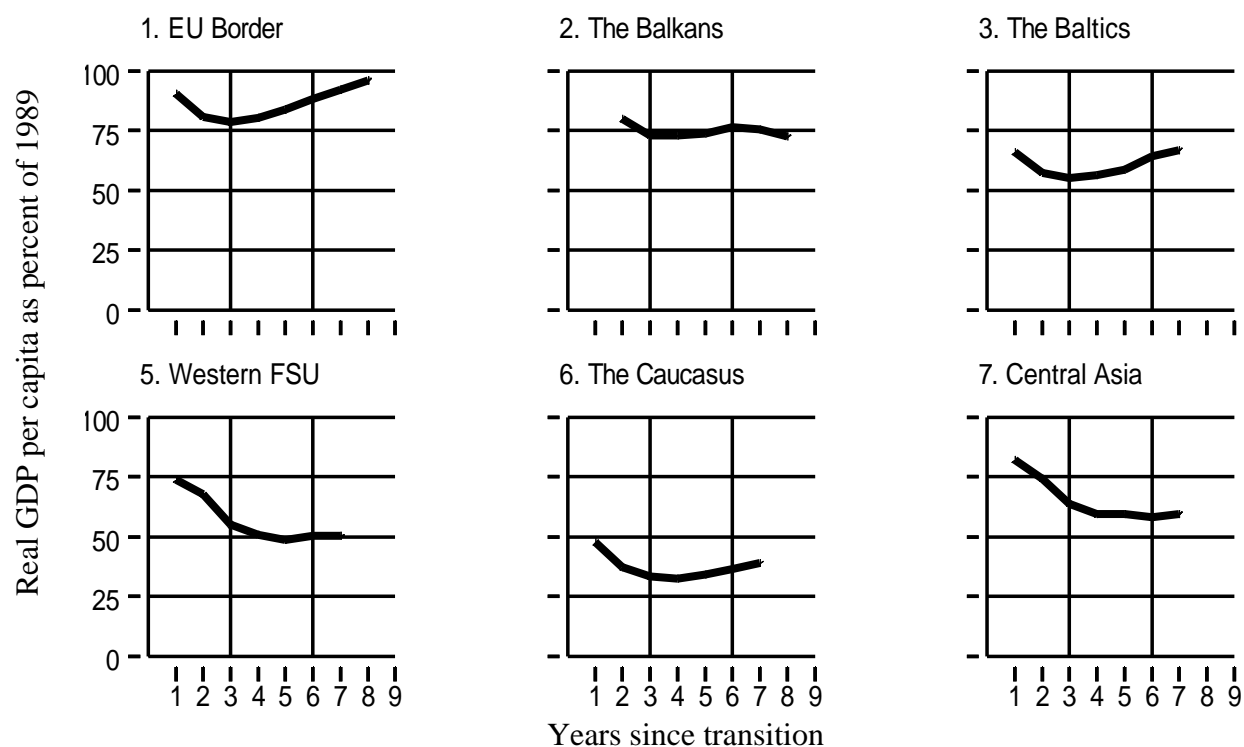
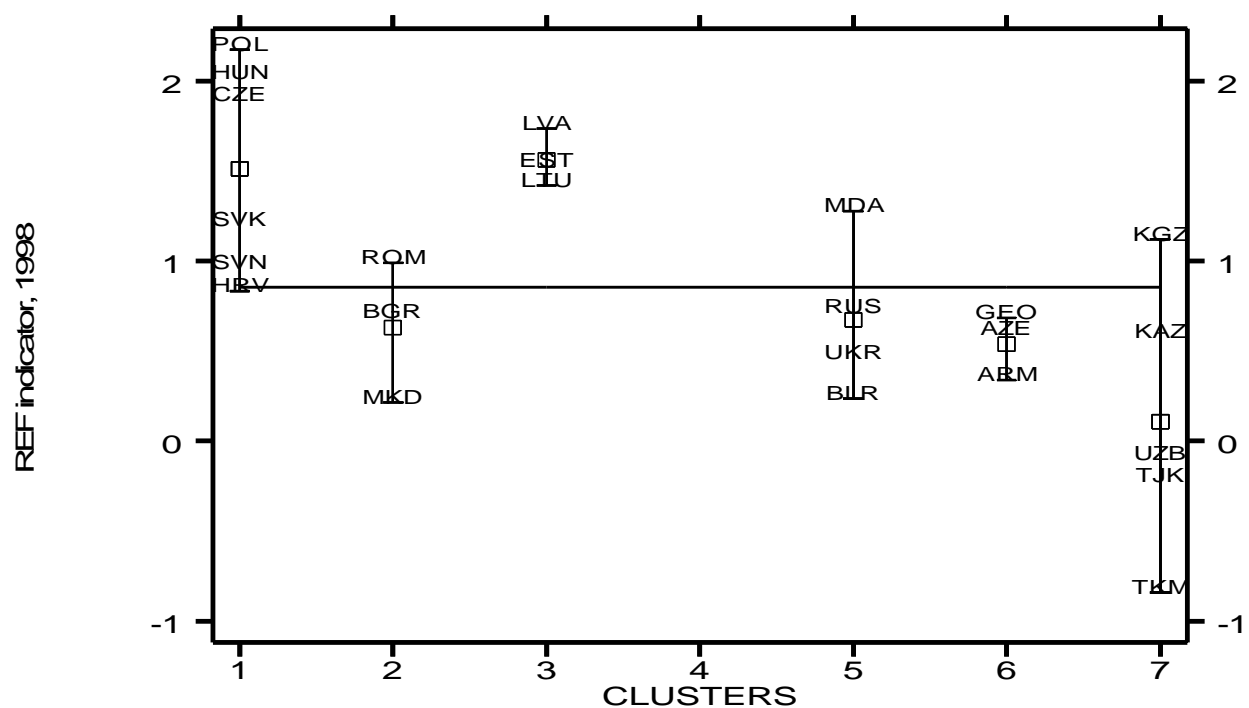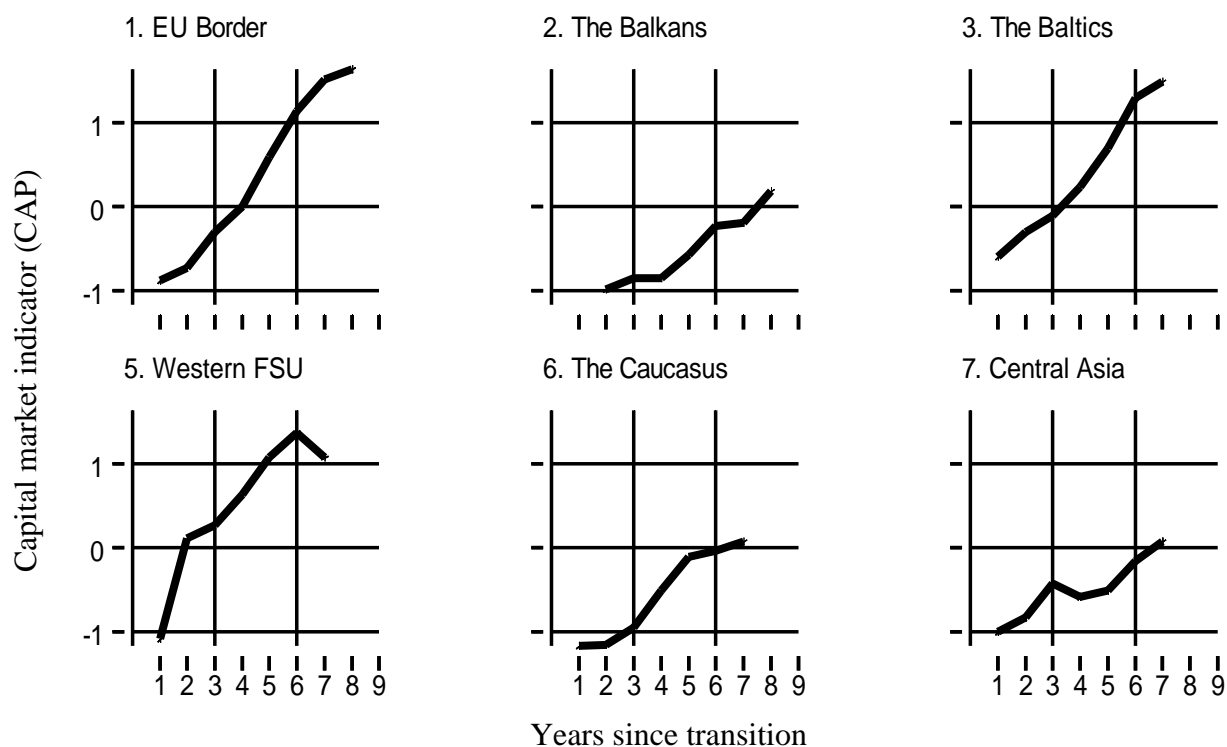(See annex 2 for graph details, including definitions, symbols and data exclusions.)
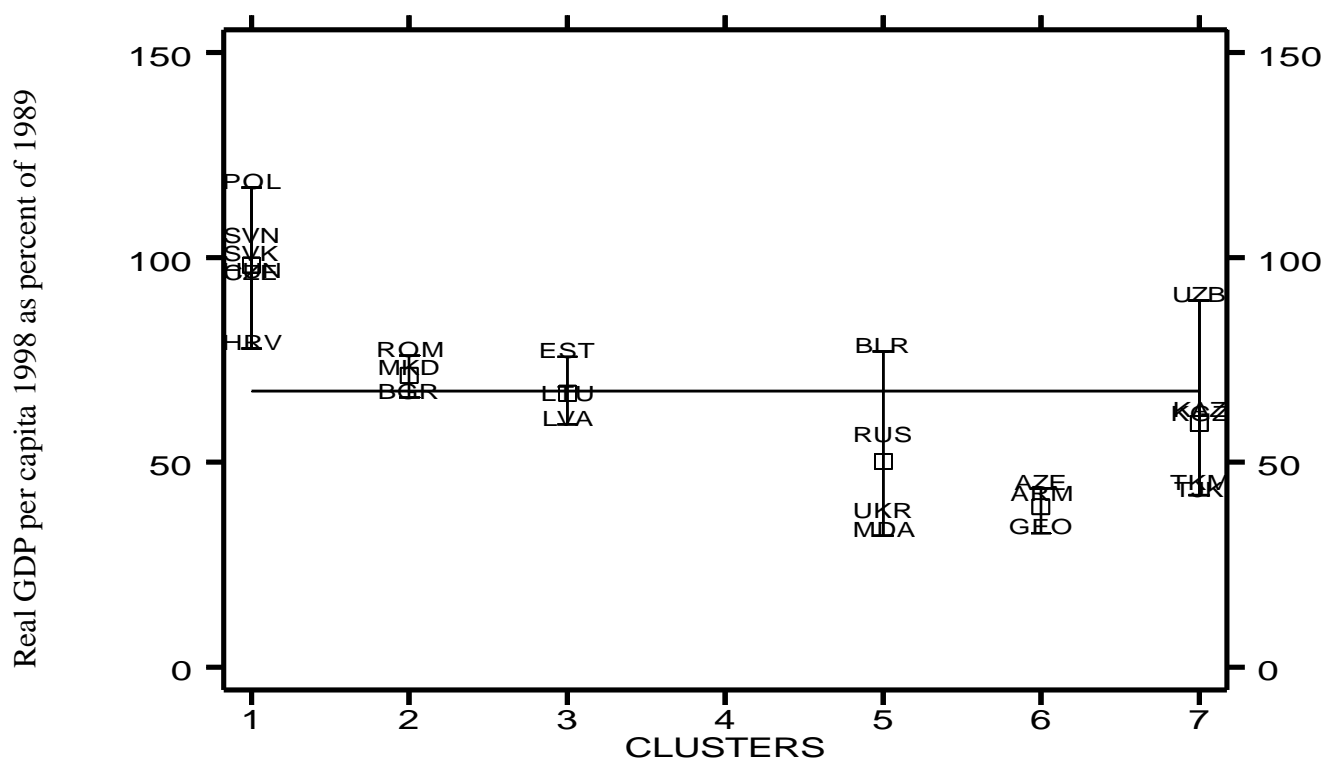
Figure 7: Inter-cluster variation over the transition period of FDI per capita (FDIpop) and FDI per capita relative to income per capita in 1989 (FDIrel). *Source*: EBRD (1999) and Sachs, Zinnes and Eilat (2000, vol. 1).
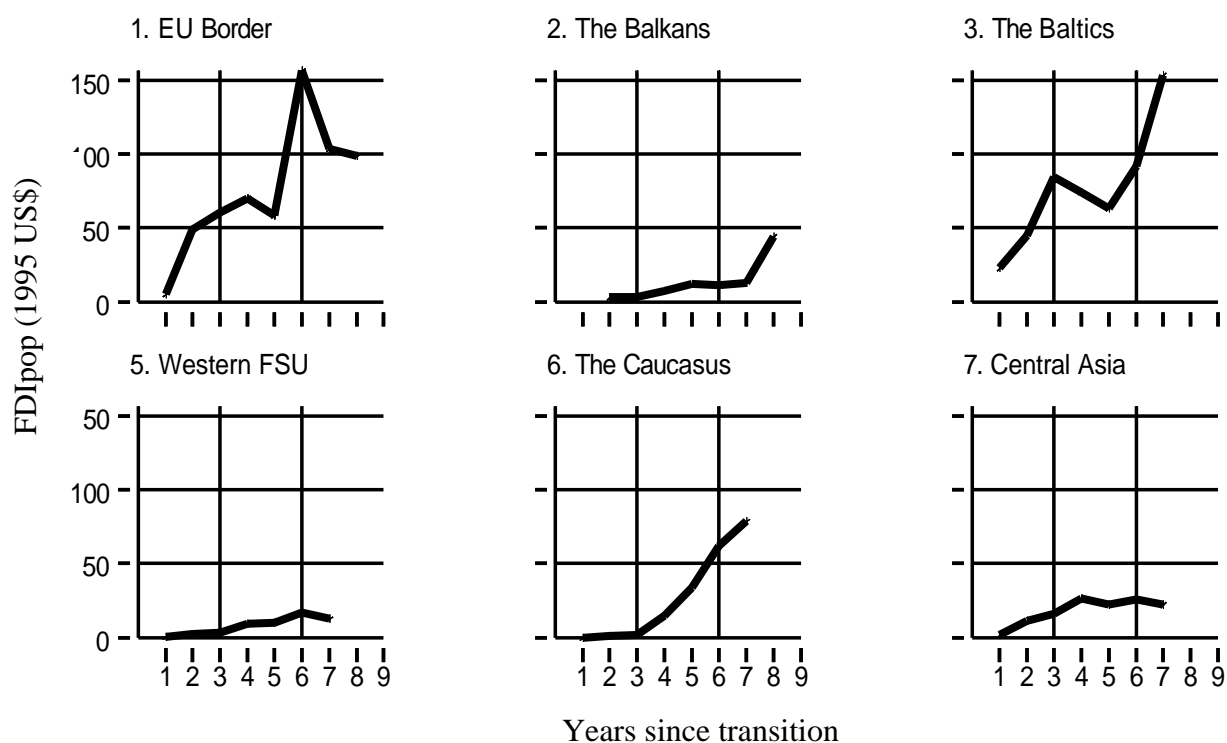
(See annex 2 for graph details, including definitions, symbols and data exclusions.)
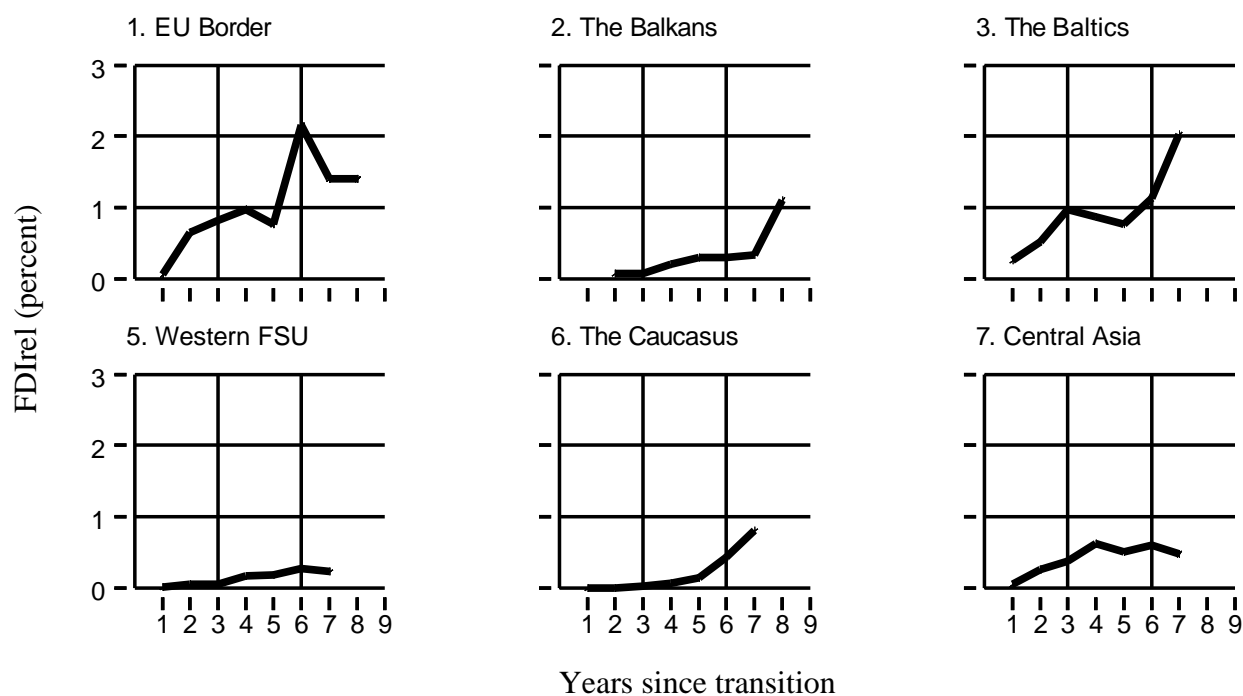
Figure 8: Inter-cluster variation over the transition period of exports relative to GDP in 1989 (EXPrel). *Source*: EBRD (1999) and Sachs, Zinnes and Eilat (2000, vol. 1).
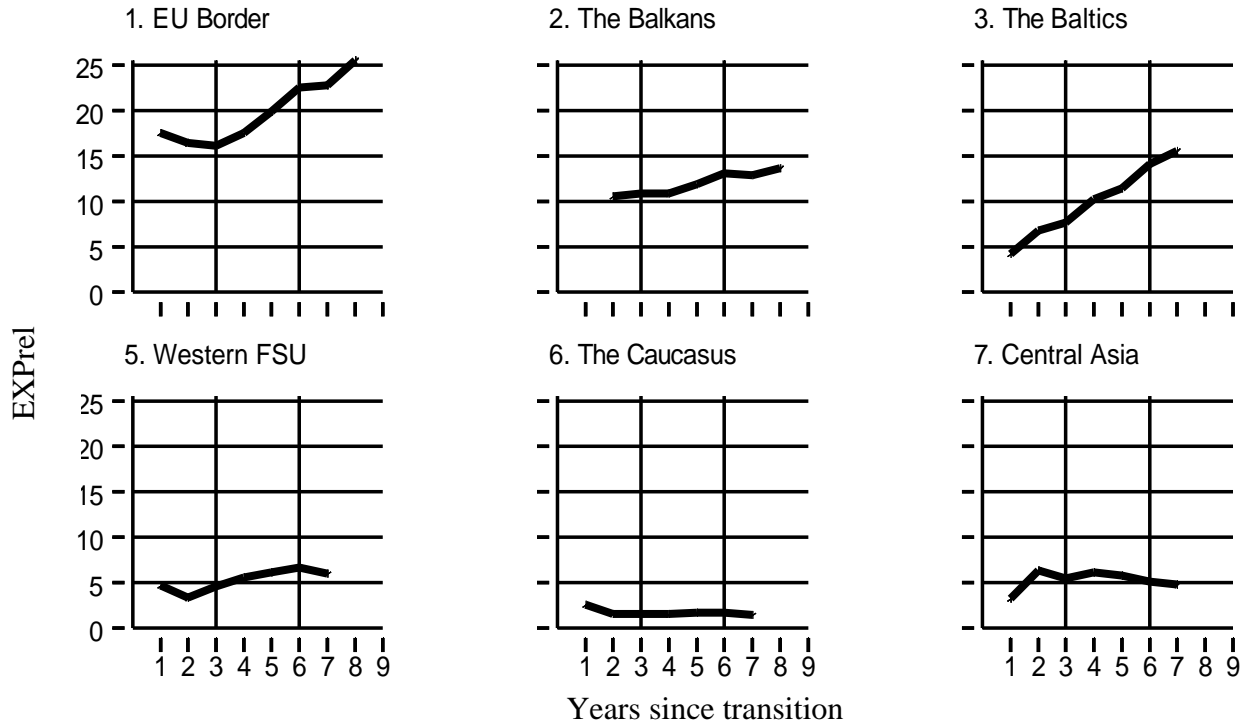
(See annex 2 for graph details, including definitions, symbols and data exclusions.)

4   Is "change of title" enough?

Armed with the elements of our framework, we are now in a stronger position to empirically examine the evidence related to the questions raised at the outset. Paramount among these is whether simply a change of title is enough to generate the gains associated, at least in theory, with privatization. This is the crux of the conversion to a market economy: creating real owner-ship.

Perhaps the most straightforward test of the Washington Consensus, that change-of-title (COT) *per se* yields the economic performance gains, is to place COT in a regression model to examine its influence in generating economic recovery. Consider:

$$PERF_{i,t} = g_1\, COT_{i,t} + g_2\, COT_{i,t-1} + g_3\, REF_{i,t} + g_4\, Z_{i,t} \tag{4.1}$$

$$+ \sum_k[g_{5k}\, CLUST(k)_{i,t}] + \sum_j[g_{6j}\, TrYEAR(j)_{i,t} + \sum_m[g_{7m}\, STAB(m)_{i,t}] + \gamma_{i,t}$$

Here "PERF" are our four performance measures described in section 3.3, namely, $IGDP_{i,t}$, $FDIpop_{i,t}$, $FDIrel_{i,t}$, and $EXPrel_{i,t}$. The i and t subscripts are for country and transition year, respectively. g denotes parameters to be estimated, the k, j, and m summations are over six clusters, eight transition periods and 3 macro-stabilization periods, respectively, and $\gamma_{i,t}$ is the regression error term. REF measures other structural reforms. The CLUST(k) are dummy variables for

each of the clusters[16]. These capture our beliefs about the importance of initial conditions. CLUST2, for example, is 1 for all countries in cluster 2 (the Balkans) and zero otherwise. The TrYEAR(j) are years-since-the-start-of-transition dummy variables. These capture our belief that systemic transformation, population expectations, learning-by-doing and other factors cause countries to follow an adjustment process linked to the years since transition began. TrYEAR3, for example, is 1 for all observations taking place in the third year of transition and zero otherwise. TrYEAR1 has been dropped, along with the regression's constant term to facilitate coefficient interpretation. STAB(m) comprises three dummy variables that capture the impact of macro-stabilization. STAB1 is 1 for the first two years of macro-stabilization and zero before and after; STAB2 is 1 for years three through five after macro-stabilization and zero before and after; STAB3 is 1 for the sixth year and beyond of macro-stabilization and zero otherwise. Z represents other variables we use, depending on the dependent variable performance measure, to control for within-cluster variance such as $IGDP_{i,t-1}$, $INCpc89_i$ (de Melo *et. al.*'s per capita income in 1989 at purchasing power parity), and LnPOP (log of population). Here we use $INCpc89$ in the FDI regressions to reflect the fact that higher income countries generally attract more foreign direct investment and LnPOP in the EXPrel regressions to capture the empirically observed fact that, *ceteris paribus*, small countries are more export-intensive than big countries.

While this equation (and those below) at first appears to follow such work in the literature as de Melo *et. al.* (1995) and Havrylyshyn *et. al.* 1998 and 1999, they also have some important differences. First we do not use the *annual* growth rate of real gross domestic product as a dependent variable but the growth since 1989. Second, rather than using the initial condition variables of de Melo *et. al.* (1995) or country dummies, our framework focuses on clusters of transition countries developed in Sachs, Zinnes and Eilat (2000, vol. 1). Finally, we use a series of macro-stabilization dummies instead of log inflation as a proxy for the effect of macro stabilization policies.

Table 3 provides estimates of the regressions for the alternative specifications implied by equation (4.1) for the panel of 24 countries from the start of transition through 1998. The results are broadly in agreement with each other regardless of the economic performance measure (though EXPrel yields the weakest correlations). They indicate that the level of reforms contributes to recovery (the g_3 are significantly positive), but that change-of-title alone has little effect. This conclusion holds both for contemporaneous privatization (the g_1 are not significant) as well as for past-period effects of COT (the g_2 are not significant). It is also true regardless of the economic performance measure used. COT alone is simply not enough to generate economic performance gains.

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[16] While it is usual to drop one category of an exhaustive set, here we have chosen instead to drop the regression's constant term. This facilitates interpreting the cluster dummies' coefficients as corrections to the sample average in transition year 1 and before macro stabilization.

Table 3: Does change of title alone generate gains from privatization?
Regressions a-f

Regression	a	b	c	d	e	f
Dependent Variable	IGDPl	IGDPl	IGDP	IGDP	IGDP	IGDP
COT	0.714	0.306	-3.732		1.191	1.482
	0.447	0.192	-1.096		0.981	0.917
COT, one-period lagged			4.527	1.037		
			1.233	0.566		
REF	5.122	4.918	6.392	6.478	0.755	4.432
	2.334 **	2.143 **	2.348 **	2.379 **	0.441	2.025 **
EU Border	103.622	104.102	83.932	82.654	53.180	90.342
	28.581 ***	24.391 ***	12.799 ***	12.799 ***	9.773 ***	13.13 ***
Balkan fixed effect	97.733	98.768	77.496	76.798	47.481	90.147
	18.050 ***	17.421 ***	13.897 ***	13.852 ***	7.605 ***	14.278 ***
Baltic fixed effect	74.760	75.443	54.076	52.961	38.383	60.165
	21.389 ***	17.316 ***	6.694 ***	6.604 ***	8.901 ***	8.217 ***
Western FSU fixed effect	75.435	76.239	53.097	52.612	37.966	64.106
	17.960 ***	17.920 ***	7.92 ***	7.859 ***	7.987 ***	9.853 ***
Caucasus fixed effect	58.952	59.475	39.403	38.816	30.413	49.153
	11.574 ***	11.491 ***	6.442 ***	6.366 ***	6.289 ***	7.401 ***
Central Asia fixed effect	87.316	87.715	66.450	66.120	42.509	80.352
	17.582 ***	17.071 ***	11.423 ***	11.373 ***	7.534 ***	13.872 ***
Year-of-transition dummies^	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies^		yes				
IGDP, one-period lagged					0.558	
					10.954 ***	
INCpc89						0.002
						2.26 **
Number of observations	179	179	155	155	178	179
Adjusted R-squared	0.97	0.98	0.97	0.97	0.99	0.97

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

Table 3: Does change of title alone generate gains from privatization? (continued)
Regressions g-l

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
COT	0.005	-0.023	-0.018	-2.202	-0.228	-0.236
	0.048	-0.224	-0.003	-0.320	-0.270	-0.276
COT, one-period lagged	0.210	0.148	15.818	10.896	-0.427	-0.628
	1.558	1.022	1.709 *	1.101	-0.352	-0.491
REF	0.742	0.608	-2.413	-10.607	63.881	64.790
	3.262 ***	2.208 **	-0.084	-0.353	7.087 ***	7.133 ***
EU Border	0.198	0.110	-27.573	-33.808	53.742	55.030
	0.595	0.307	-1.046	-1.227	5.612 ***	5.720 ***
Balkan fixed effect	0.589	0.445	-14.069	-22.846	51.570	52.594
	2.754 ***	1.623	-0.462	-0.711	6.251 ***	6.284 ***
Baltic fixed effect	-0.045	-0.084	-55.836	-56.883	52.767	53.995
	-0.175	-0.315	-2.062 **	-2.089 **	5.435 ***	5.574 ***
Western FSU fixed effect	0.151	0.084	-18.791	-22.803	44.730	45.672
	0.457	0.244	-0.679	-0.812	4.862 ***	4.967 ***
Caucasus fixed effect	0.365	0.271	-13.489	-19.977	49.718	50.640
	1.193	0.835	-0.557	-0.796	5.267 ***	5.358 ***
Central Asia fixed effect	0.064	0.147	1.869	7.662	1.682	2.173
	0.276	0.630	0.119	0.486	0.740	0.957
Year-of-transition dummies^	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies^		yes		yes		yes
INCpc89			0.008	0.008		
			2.508 ***	2.389 **		
LnPOP					-3.034	-3.085
					-5.575 ***	-5.710 ***
Number of observations	171	171	178	178	166	166
Adjusted R-squared	0.55	0.56	0.57	0.58	0.83	0.83

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

In fact, given the tenor of the paradigm debate as described at the start of this paper, this result may come as no surprise. At the same time, the literature review suggests where to look for the missing element: institutions (broadly defined) that address the agency problem. On the one hand, these include those related to prudential, regulatory, and budgetary authorities. As described in section 0, these are exactly what our variable "OBCA" captures: namely, the management objective, corporate governance, and the hardness of the firm's budget constraint. On the other hand, the regulatory framework is of limited value without liquid and well functioning markets. Therefore, the level of capital market development (our CAP variable from 3.2) is also important.

Before pursuing these insights, we may use the regressions from Table 3 to test two of our three maintained hypotheses. (The third hypothesis regarding the importance of initial conditions is tested in section 6). First, the transition year dummies (provided in Annex 3) are significantly different from zero in the case of IGDP and EXPrel. This result is supportive of our

approach,[17] even at the level of aggregation of the full sample, that there is a generic transition path that countries appear to follow.[18] Typically, this path is one of worsening performance until period six where average recovery begins. Second, while the macro-stabilization dummies (also in Annex 3) are not generally significant, macro-stabilization appears to have a negative effect in the first two years of imposition, becoming less (and sometimes positive) over time (e.g., $g_{71} < g_{72} < 0 < g_{73}$).

Returning to the question of COT's lack of effectiveness, let us now make two changes to equation (4.1) to introduce institutions into the analysis. First, we add OBCA and second, we separate REF into a capital markets indicator, CAP, and a residual progress-in-reforms, REFmK ("mK" for minus capital markets). Equation (4.1) becomes

$$PERF_{i,t} = g_1 COT_{i,t} + g_2 COT_{i,t-1} + g_8 OBCA_{i,t} + g_9 OBCA_{i,t-1} + g_{10} CAP_{i,t} + g_{11} REFmK_{i,t}$$

$$+ \ldots + \gamma_{i,t} \tag{4.2}$$

where, as before, PERF refers to each of the four performance measures and now the "…" refers to Z and the dummy variables CLUST(k), TrYear(j), and STAB(m). Table 4 provides estimates of the regressions for the alternative specifications from equations (4.2) for the panel of 24 countries from the start of transition through 1998. A number of conclusions can be inferred from these regressions.

First, regardless of the performance measure, the introduction of OBCA and CAP does not change the fundamental result that COT *ceteris paribus* has little effect on achieving privatization gains.[19] This is true whether in the short run (contemporaneous COT effect measured by g_1 is not significantly different from zero) or in the long run (total contemporaneous and lagged COT effect as measured by g_1+g_8 is zero). It is also true whether lagged and contemporaneous effects are tested in the same or separate regressions.

Second, for most specifications, OBCA has a positive contemporaneous (short run) effect on generating performance gains from privatization (measured by g_8 being significantly different from zero). While the contribution of past-period OBCA improvements to economic performance is consistently positive (g_9 is significantly different from zero), the long-term effect of OBCA alone, however, is weak (i.e., we cannot reject the hypothesis that g_8+g_9 is significantly different from zero)[20]. These results suggest that while the effect of OBCA alone on economic performance is supportive, we should look further to substantiate its theoretical importance.

Finally, the existence of capital markets is uniformly supportive of economic performance. Note that once the level of capital market reforms is accounted for, i.e., once separated from the REF progress-in-reforms indicator, the effect of other reforms (REFmK) is quite muted.

We need to be careful in interpreting these results. They do not imply that that privatization, "deep" or otherwise, has little impact on economic performance. Rather, they indicate that, with the exception of the level of capital market development, change of title or agency-related regulations *each taken on its own* has at best a limited effect on economic performance. What we

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[17] There were too few observations to estimate transition dummies specific to *each* cluster.

[18] The interpretation of these dummies is more complicated in those regressions that contain the STAB(m) dummies.

[19] In fact, the contemporaneous COT coefficient is generally negative, suggesting that if COT has any short-run own-effect, it probably contributes to performance *losses*, not gains.

[20] This joint test may be failing due to multicollinearity among right-hand-side variables. Note, for example, that the sum of the estimated coefficients for OBCA and lagged OBCA is quite positive.

need to test is whether OBCA, CAP or REFmK in conjunction with COT strengthen the effect of the latter. In other words, to test the "new paradigm", we need to see whether economic performance gains require *simultaneous* improvements in both COT *and* OBCA. We refer to such a simultaneous improvement as the "deep privatization" effect. This is the subject of the next section.

Table 4: The importance of "OBCA" reforms and capital markets to performance. Regressions a-f

Regression	a	b	c	d	e	f
Dependent Variable	*IGDP*	*IGDP*	*IGDP*	*IGDP*	*IGDP*	*IGDP*
COT	-0.520	-0.798	-5.540		0.559	0.224
	-0.319	*-0.490*	*-1.609*		*0.499*	*0.133*
COT, one-period lagged			5.471	0.296		
			1.492	*0.161*		
OBCA	2.678	2.476	-0.310		1.762	2.451
	1.903 *	*1.795 **	*-0.144*		*1.822 **	*1.743 **
OBCA, lagged one period			3.278	2.953		
			1.981 **	*2.092 ***		
REFmK	0.859	1.675	1.771	2.112	-0.536	0.917
	0.434	*0.807*	*0.713*	*0.895*	*-0.394*	*0.466*
CAP	5.446	4.419	4.571	4.423	1.811	4.710
	3.305 ***	*2.663 ****	*2.568 ****	*2.487 ****	*1.558*	*2.774 ****
EU Border	102.55	104.045	82.129	29.733	48.204	92.988
	26.545 ***	*23.490 ****	*12.173 ****	*8.343 ****	*9.880 ****	*13.390 ****
Balkan fixed effect	99.749	101.344	77.913	26.387	44.916	94.102
	18.392 ***	*17.917 ****	*13.876 ****	*5.007 ****	*8.078 ****	*14.740 ****
Baltic fixed effect	74.133	75.433	52.234		34.747	63.427
	19.178 ***	*16.561 ****	*6.412 ****		*8.731 ****	*8.421 ****
Western FSU fixed effect	73.391	75.659	50.226	-0.825	34.602	65.474
	16.609 ***	*16.774 ****	*7.182 ****	*-0.184*	*8.218 ****	*10.073 ****
Caucasus fixed effect	63.103	64.663	42.175	-9.488	33.126	55.912
	11.825 ***	*11.964 ****	*6.593 ****	*-1.784 **	*7.704 ****	*8.148 ****
Central Asia fixed effect	89.044	90.507	66.343	15.486	41.384	83.948
	17.481 ***	*17.188 ****	*11.281 ****	*3.070 ****	*8.259 ****	*14.156 ****
Year-of-transition dummies^	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies^		yes				
IGDP, one-period lagged					0.636	
					13.262 ***	
INCpc89						0.001
						1.653 *
Number of observations	173	173	149	149	173	173
Adjusted R-squared	0.976	0.976	0.975	0.975	0.989	0.976

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

Table 4: The importance of "OBCA" reforms and capital markets to performance (continued). Regressions g-l

Regression	g	h	i	j	k	l
Dependent Variable	*FDIrel*	*FDIrel*	*FDIpop*	*FDIpop*	*EXPrel*	*EXPrel*
COT	-0.078	-0.101	-5.020	-6.870	-0.293	-0.284
	-0.733	*-0.929*	*-0.694*	*-0.931*	*-0.333*	*-0.319*
OBCA	0.140	0.131	9.937	9.280	0.135	0.146
	1.580	*1.473*	*1.634 *￼*	*1.527*	*0.172*	*0.186*
REFmK	-0.015	-0.041	1.255	-1.088		
	-0.120	*-0.296*	*0.146*	*-0.117*		
CAP	0.254	0.213	15.887	12.844		
	*2.419 **￼*	*1.969 **￼*	*2.183 **￼*	*1.722 *￼*		
REF					-0.261	-0.419
					-0.194	*-0.296*
EU Border	0.517	0.402	-4.394	-12.925	64.039	65.094
	*2.016 **￼*	*1.323*	*-0.147*	*-0.414*	*6.545 ***￼*	*6.605 ***￼*
Balkan fixed effect	0.093	0.008	-26.596	-33.515	54.106	55.515
	0.266	*0.022*	*-0.969*	*-1.169*	*5.247 ***￼*	*5.355 ***￼*
Baltic fixed effect	0.414	0.276	-12.484	-22.566	51.601	52.790
	*1.656 *￼*	*0.908*	*-0.387*	*-0.670*	*5.720 ***￼*	*5.783 ***￼*
Western FSU fixed effect	-0.330	-0.335	-62.134	-62.295	52.960	54.274
	-1.160	*-1.114*	*-2.233 **￼*	*-2.210 **￼*	*5.126 ***￼*	*5.259 ***￼*
Caucasus fixed effect	0.072	0.034	-14.453	-18.073	44.908	46.008
	0.193	*0.086*	*-0.491*	*-0.603*	*4.542 ***￼*	*4.649 ***￼*
Central Asia fixed effect	0.218	0.146	-16.504	-22.471	50.201	51.247
	0.662	*0.415*	*-0.646*	*-0.846*	*4.934 ***￼*	*5.024 ***￼*
Year-of-transition dummies^	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies^		yes		yes		yes
INCpc89			0.007	0.007		
			*1.934 *￼*	*1.877 *￼*		
LnPOP					-3.080	-3.125
					*-5.312 ***￼*	*-5.414 ***￼*
Number of observations	165	165	172	172	162	162
Adjusted R-squared	0.564	0.568	0.582	0.587	0.831	0.834

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

5   Complementary reforms to deepen privatization gains

We may examine what other policy reforms deepen privatization impacts on economic perform-ance by adding interaction terms to our model as follows:

$$PERF_{i,t} = g_1\,COT_{i,t} + g_8\,OBCA_{i,t} + g_{10}\,CAP_{i,t} + g_{11}\,REFmK_{i,t} \qquad (5.1)$$

$$+\ g_{14}\,COT_{i,t}*\,REFmK_{i,t} + g_{15}\,OBCA_{i,t}*\,CAP_{i,t} + g_{16}\,OBCA_{i,t}*\,REFmK_{i,t}$$

$$+\ g_{12}\,COT_{i,t}*\,OBCA_{i,t} + g_{13}\,COT_{i,t}*\,CAP_{i,t} + \ldots + \gamma_{i,t}$$

where, as before, PERF refers to each of the four performance measures and the "…" refers to Z and the dummy variables CLUST(k), TrYear(j), and STAB(m).[21] As an example, a positive coefficient on COT*OBCA (i.e., COT multiplied by OBCA) would mean that the effect of COT depends positively on the level of OBCA present. A given level of COT would have a bigger effect the more OBCA is present.

Table 5: Estimating the interaction between COT and OBCA. Regressions a-f

Regression	a	b	e	f
Dependent Variable	IGDP	IGDP	IGDP	IGDP
COT	0.770	0.176	1.095	1.525
	0.489	0.110	1.006	0.957
OBCA	3.377	2.855	2.125	3.202
	2.362 **	1.988 **	2.143 **	2.263 **
REF	4.597	4.730	0.693	4.032
	2.021 **	1.962 **	0.433	1.783 *
COT*OBCA	3.343	2.147	1.520	3.293
	3.363 ***	1.929 *	2.171 **	3.352 ***
EU Border	101.787	103.391	48.523	89.509
	25.891 ***	22.308 ***	9.921 ***	13.155 ***
Balkan fixed effect	100.746	101.594	46.130	93.711
	18.518 ***	17.659 ***	8.217 ***	14.980 ***
Baltic fixed effect	70.383	72.652	33.584	56.930
	17.541 ***	14.726 ***	8.510 ***	7.806 ***
Western FSU fixed effect	76.807	77.884	36.530	66.216
	18.128 ***	17.917 ***	8.605 ***	10.373 ***
Caucasus fixed effect	62.386	63.898	33.186	53.366
	11.637 ***	11.521 ***	7.680 ***	7.965 ***
Central Asia fixed effect	90.239	91.050	42.548	83.722
	17.671 ***	17.021 ***	8.393 ***	14.307 ***
Year-of-transition dummies^	yes	yes	yes	yes
Year-of-stabilization dummies^		yes		
IGDP, one-period lagged			0.627	
			13.089 ***	
INCpc89				0.002
				2.198 **
Number of observations	173	173	173	173
Adjusted R-squared	0.976	0.977	0.989	0.977

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

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[21] Note that we have not retained the lagged terms from earlier regressions. This is because they simply complicated the analysis without any compensatory explanatory gains.

Table 5: Estimating the interaction between COT and OBCA (continued). Regressions g-l

Regression	g	h	i	j	k	l
Dependent Variable	*FDIrel*	*FDIrel*	*FDIpop*	*FDIpop*	*EXPrel*	*EXPrel*
COT	0.001	-0.026	-0.387	-2.353	-0.058	-0.129
	0.010	*-0.248*	*-0.056*	*-0.331*	*-0.066*	*-0.145*
OBCA	0.163	0.149	12.515	11.741	0.721	0.544
	*1.800 **	*1.618*	*2.031 ***	*1.876 **	*0.890*	*0.661*
REF	0.145	0.082	11.205	5.787	-0.757	-0.835
	0.980	*0.511*	*1.121*	*0.535*	*-0.568*	*-0.582*
COT*OBCA	0.149	0.125	11.454	10.304	1.326	0.956
	*2.379 ***	*1.763 **	*2.701 ****	*2.146 ***	*2.435 ***	*1.547*
EU Border	0.498	0.360	-17.221	-27.996	62.049	63.003
	*1.893 **	*1.135*	*-0.584*	*-0.887*	*6.426 ****	*6.364 ****
Balkan fixed effect	0.138	0.011	-28.942	-39.312	53.449	54.299
	0.390	*0.029*	*-1.065*	*-1.369*	*5.270 ****	*5.248 ****
Baltic fixed effect	0.255	0.114	-35.800	-47.030	49.201	50.320
	0.976	*0.347*	*-1.137*	*-1.382*	*5.513 ****	*5.456 ****
Western FSU fixed effect	-0.148	-0.200	-60.197	-63.562	51.798	52.835
	-0.539	*-0.691*	*-2.183 ***	*-2.264 ***	*5.093 ****	*5.124 ****
Caucasus fixed effect	-0.019	-0.081	-24.329	-30.161	43.269	44.246
	-0.050	*-0.202*	*-0.838*	*-1.005*	*4.439 ****	*4.463 ****
Central Asia fixed effect	0.275	0.166	-18.176	-27.095	48.982	49.769
	0.824	*0.462*	*-0.713*	*-1.013*	*4.890 ****	*4.882 ****
Year-of-transition dummies*	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies*		yes		yes		yes
INCpc89			0.008	0.008		
			*2.411 ***	*2.316 ***		
LnPOP					-3.001	-3.051
					*-5.255 ****	*-5.294 ****
Number of observations	165	165	172	172	162	162
Adjusted R-squared	0.568	0.567	0.593	0.593	0.836	0.835

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant. ^ coefficients are provided in Annex 3.

Table 5 estimates the parameters of regressions for alternative specifications of these equations. Perhaps the strongest conclusion of these regressions is the powerful role of OBCA in support of COT economic performance improvements. This synergistic effect is captured in the COT*OBCA interaction term (via g_{12}), which is significant across all regression specifications.

This result has several implications. One is that the more OBCA, the better the impact of an increase in COT on economic performance. (That is, if the COT impact was positive, it will be even larger, and if the COT impact was negative, it will be less negative). The net effect on economic performance of a COT increase, however, may still be negative. An explanation for this worsening of economic performance from COT privatization is that transfer of ownership without the institutional structures in place for owners to exercise their authority simply replaces poor government control of management with weak or no private sector control.

We may determine the level of OBCA needed to generate a positive performance effect of an increase in COT by differentiating equation (5.1) with respect to COT for the specification in which there is only the COT*OBCA interaction. This yields:

$$dPERF / dCOT = g_1 + g_{12} OBCA \qquad (5.2)$$

Similarly, to determine the level of COT needed to generate a positive performance effect of an increase in OBCA, we differentiate this equation with respect to OBCA:

$$dPERF / dOBCA = g_8 + g_{12} COT \qquad (5.3)$$

From equations (5.2) and (5.3), it is clear that the sign and size of the impact of COT (OBCA) on performance depends on the level of OBCA (COT). Note that by construction at the sample mean (across all countries *and* the transition periods), OBCA=0 and COT=0. Consequently, since g_1 is not significantly different from zero, an average level of OBCA is not enough to ensure COT has a positive economic performance gain. But in the case of OBCA, since g_8 *is* statistically significant and positive, an average level of COT *is* enough to ensure OBCA has a positive economic performance gain. To be more precise about the effect of COT on performance, we can use direct statistical tests to determine the critical levels of OBCA above (below) which an increase in COT guarantees a positive (negative) effect on performance. We do this by performing one-sided F-tests using the coefficients estimated in regression "*a*" of Table 5. To find the upper (lower) critical value, we search for the minimum (maximum) value of OBCA for which the null hypothesis that dPERF/dCOT in equation (5.2) is smaller (greater) than zero can be rejected for a chosen confidence level. We then repeat this exercise using dPERF/dOBCA in equation (5.3) to determine the critical levels of COT for which OBCA has a significant impact on performance.

Figure 9: Values of OBCA (COT) required for an increase in COT (OBCA) to generate economic performance gains or losses in GDP. *Source:* Authors' estimates, using one-sided F-test for coefficients estimated in regression 1 on Table **5**.

LEVELS OF OBCA, FOR WHICH:
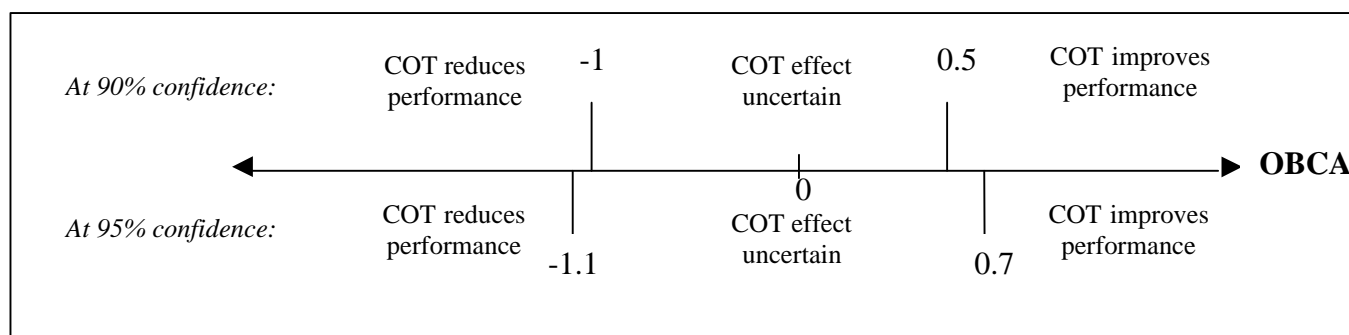
LEVELS OF COT, FOR WHICH:
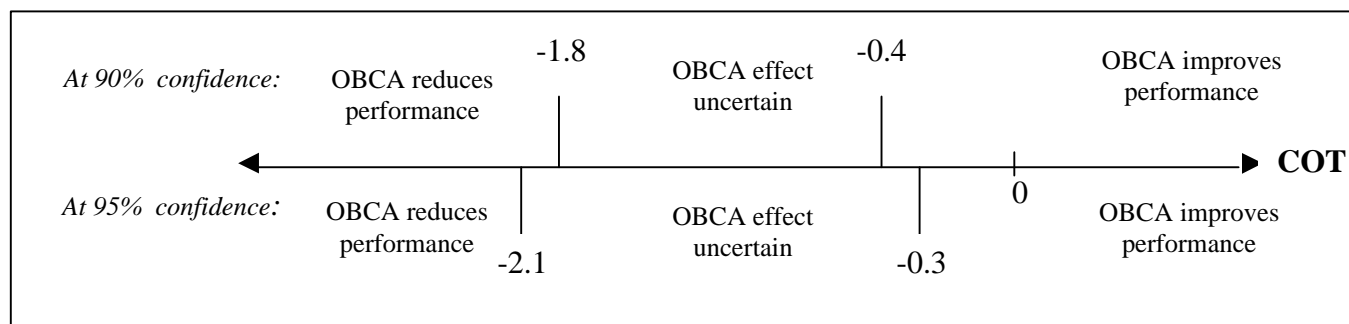
In the case when the dependent variable (PERF) is IGDP, the results of these tests for confidence levels of 90 and 95 percent are shown in Figure 9. As an example, at the 10 percent significance level, for any country with a level of OBCA below –1.0 (i.e., one standard deviation below the sample mean across all countries and years), *any* COT increase will cause a loss in economic performance. Similarly, at the 5 percent significance level, for any country with a level of OBCA above 0.5, *any* COT increase will cause a gain in economic performance. While only indicative, it is interesting to inquire what countries and clusters fall into these ranges. These are shown in Table 6 for the case of changes in COT and for the 95 percent confidence level. The table suggests that, with the exception of Bulgaria since 1997 (and Armenia for just 1997), only the EU Border States and the Baltics have high enough levels of OBCA so that any size increases in COT are likely to generate economic performance improvements. On the other hand, with the notable exception of the Czech Republic in 1990, no countries in the EU Border States or the Baltics appear to have had OBCA levels so low such that there would be a likely loss in their economic performance from a COT increase.

While we do not present here an analogous table for changes in OBCA, one should nonetheless note that no country in our sample had a COT level low enough to generate negative performance impacts from an increase in OBCA, even at the 90 percent confidence level. That is,

OBCA may not always generate improved performance in the short run, but it has not proven to do any harm.[22]

Table 6: Years in which OBCA levels would have caused a COT increase to lead to a gain (loss) in IGDP, at a 95 percent confidence. *Source:* Authors' calculations.

Country	IGDP gain (years)	IGDP loss (years)
Armenia	1997	Through 1994
Azerbaijan	Never	1992
Belarus	Never	Since 1997
Bulgaria	Since 1997	Never
Croatia	Since 1996	Never
Czech Rep.	Since 1994	1990
Estonia	All years	Never
Georgia	Never	Through 1994
Hungary	Since 1994	Never
Kazakhstan	Never	1994
Kyrgyz Rep.	Never	Never
Latvia	1993, since 1996	Never
Lithuania	Through 1993, Since 1996	Never
Macedonia	Never	Never
Moldova	Never	Never
Poland	Since 1994	Never
Romania	1998	Through 1991
Russia	Never	1996-1997
Slovakia	Since 1994	Never
Slovenia	Since 1994	Never
Tajikistan	Never	Through 1995
Turkmenistan	Never	Never
Ukraine	Never	Through 1994
Uzbekistan	Never	Never

A second set of results come from Table 7 and refers to the complementary effect to COT on economic performance the higher is the level of other reforms (REF). Here we see that the interaction term, COT*REF is significantly positive, though contemporaneous COT remains insignificant. Thus, the higher is the level of progress in overall reforms, the bigger gain there is to change of title privatization. Nevertheless, as shown in Table 8, once both COT*OBCA and COT*REF interactions are included together, the "OBCA synergies" still seem to dominate statistically since it is the OBCA effect that remains positive and statistically significant (though none hold in the EXPrel case).

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[22] As will be seen in the next section, the harmlessness of OBCA no longer holds once we allow for cluster-specific performance responses to policy. What we have picked up here is an average effect.

Table 7: Estimating the interaction between COT and REF.
Regressions a-f

Regression	a	b	e	f
Dependent Variable	*IGDP*	*IGDP*	*IGDP*	*IGDP*
COT	-0.346	-0.358	0.431	0.412
	-0.215	*-0.219*	*0.396*	*0.252*
OBCA	2.209	2.004	1.671	2.044
	1.598	*1.464*	*1.788 **	*1.490*
REF	5.278	5.241	0.934	4.738
	*2.298 ***	*2.167 ***	*0.590*	*2.069 ***
COT*REF	2.932	1.000	2.068	2.741
	*2.619 ****	*0.736*	*2.726 ****	*2.463 ***
EU Border	97.955	103.234	44.303	86.814
	*21.252 ****	*17.814 ****	*8.832 ****	*12.137 ****
Balkan fixed effect	95.929	100.178	42.038	89.605
	*16.738 ****	*15.670 ****	*7.601 ****	*13.831 ****
Baltic fixed effect	68.448	73.629	30.597	56.153
	*15.226 ****	*12.648 ****	*7.439 ****	*7.454 ****
Western FSU fixed effect	72.545	76.784	32.819	62.895
	*15.688 ****	*15.153 ****	*7.686 ****	*9.512 ****
Caucasus fixed effect	58.804	63.393	29.853	50.640
	*10.258 ****	*10.190 ****	*6.762 ****	*7.271 ****
Central Asia fixed effect	85.244	89.696	38.229	79.460
	*15.407 ****	*14.616 ****	*7.520 ****	*12.858 ****
Year-of-transition dummies	yes	yes	yes	yes
Year-of-stabilization dummies		yes		
IGDP, one-period lagged			0.637	
			*13.638 ****	
INCpc89				0.002
				*2.023 ***
Number of observations	173	173	173	173
Adjusted R-squared	0.976	0.976	0.989	0.979

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Table 7: Estimating the interaction between COT and REF (continued). Regressions g-l

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
COT	-0.051	-0.068	-4.049	-5.619	-0.533	-0.434
	-0.489	-0.636	-0.572	-0.777	-0.607	-0.477
OBCA	0.118	0.109	8.772	8.277	0.213	0.169
	1.346	1.234	1.473	1.383	0.273	0.215
REF	0.168	0.101	13.027	7.229	-0.690	-0.715
	1.129	0.622	1.295	0.665	-0.514	-0.491
COT*REF	0.131	0.097	9.805	8.290	1.387	0.738
	1.843 *	1.092	2.036 **	1.376	2.033 **	0.858
EU Border	0.295	0.220	-27.797	-36.800	63.108	63.990
	0.952	0.539	-0.900	-1.056	6.512 ***	6.432 ***
Balkan fixed effect	-0.107	-0.173	-44.459	-52.774	54.109	54.841
	-0.288	-0.399	-1.584	-1.687 *	5.304 ***	5.270 ***
Baltic fixed effect	0.142	0.047	-39.171	-49.496	50.919	51.751
	0.482	0.117	-1.210	-1.364	5.702 ***	5.615 ***
Western FSU fixed effect	-0.363	-0.357	-72.386	-73.825	52.839	53.670
	-1.206	-1.035	-2.546 ***	-2.458 **	5.170 ***	5.184 ***
Caucasus fixed effect	-0.183	-0.195	-34.970	-39.031	44.204	45.104
	-0.457	-0.435	-1.162	-1.206	4.516 ***	4.528 ***
Central Asia fixed effect	0.023	-0.021	-34.403	-41.039	49.414	50.275
	0.063	-0.050	-1.280	-1.371	4.906 ***	4.894 ***
Year-of-transition dummies	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies		yes		yes		yes
INCpc89			0.008	0.007		
			2.234 **	2.160 **		
LnPOP					-3.192	-3.168
					-5.539 ***	-5.464 ***
Number of observations	165	165	172	172	162	162
Adjusted R-squared	0.561	0.561	0.585	0.586	0.834	0.833

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Table 8: Estimating the interaction between COT and OBCA and between COT and REF. Regressions a-f

Regression	a	b	e	f
Dependent Variable	*IGDP*	*IGDP*	*IGDP*	*IGDP*
COT	0.534	0.373	0.561	1.373
	0.325	*0.224*	*0.497*	*0.820*
OBCA	3.255	2.922	1.835	3.130
	2.240 **	*2.016 ***	*1.834 **	*2.177 ***
REF	4.693	4.718	0.874	4.097
	2.051 **	*1.952 ***	*0.549*	*1.798 **
COT*OBCA	2.877	2.464	0.440	3.012
	2.121 **	*1.823 **	*0.465*	*2.244 ***
COT*REF	0.764	-0.679	1.742	0.461
	0.507	*-0.416*	*1.684 **	*0.308*
EU Border	100.478	104.848	45.052	88.882
	21.330 ***	*18.018 ****	*8.531 ****	*12.482 ****
Balkan fixed effect	99.574	102.850	42.961	93.097
	16.813 ***	*15.794 ****	*7.295 ****	*14.144 ****
Baltic fixed effect	69.396	73.895	30.999	56.513
	15.532 ***	*12.786 ****	*7.358 ****	*7.598 ****
Western FSU fixed effect	75.668	79.048	33.566	65.669
	15.751 ***	*15.260 ****	*7.341 ****	*9.885 ****
Caucasus fixed effect	61.294	65.078	30.430	52.827
	10.588 ***	*10.425 ****	*6.620 ****	*7.608 ****
Central Asia fixed effect	88.923	92.399	39.110	83.014
	15.492 ***	*14.741 ****	*7.193 ****	*13.172 ****
Year-of-transition dummies	yes	yes	yes	yes
Year-of-stabilization dummies		yes		
IGDP, one-period lagged			0.633	
			13.253 ***	
INCpc89				0.002
				2.152 **
Number of observations	173	173	173	173
Adjusted R-squared	0.976	0.977	0.989	0.977

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Table 8: Estimating the interaction between COT and OBCA and between COT and REF (continued). Regressions g-l

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
COT	-0.009	-0.029	-0.940	-2.742	-0.183	-0.113
	-0.079	*-0.266*	*-0.130*	*-0.370*	*-0.201*	*-0.120*
OBCA	0.160	0.148	12.277	11.653	0.633	0.553
	1.744 *	*1.603*	*1.968 ***	*1.851 **	*0.761*	*0.658*
REF	0.147	0.081	11.349	5.689	-0.803	-0.821
	0.989	*0.502*	*1.131*	*0.524*	*-0.599*	*-0.564*
COT*OBCA	0.131	0.120	10.340	9.656	1.069	0.982
	1.513	*1.378*	*1.768 **	*1.642 **	*1.404*	*1.281*
COT*REF	0.030	0.011	1.826	1.407	0.460	-0.062
	0.305	*0.102*	*0.278*	*0.192*	*0.486*	*-0.058*
EU Border	0.441	0.333	-19.831	-30.797	62.126	63.038
	1.364	*0.804*	*-0.639*	*-0.883*	*6.416 ****	*6.333 ****
Balkan fixed effect	0.087	-0.013	-31.536	-41.900	53.578	54.321
	0.221	*-0.028*	*-1.094*	*-1.318*	*5.267 ****	*5.228 ****
Baltic fixed effect	0.211	0.091	-37.491	-49.279	49.440	50.339
	0.711	*0.228*	*-1.166*	*-1.366*	*5.517 ****	*5.435 ****
Western FSU fixed effect	-0.197	-0.221	-62.418	-65.699	51.983	52.846
	-0.618	*-0.619*	*-2.168 ***	*-2.170 ***	*5.094 ****	*5.106 ****
Caucasus fixed effect	-0.062	-0.102	-26.604	-32.482	43.354	44.273
	-0.153	*-0.226*	*-0.879*	*-1.001*	*4.436 ****	*4.445 ****
Central Asia fixed effect	0.218	0.141	-21.156	-29.897	48.957	49.809
	0.570	*0.323*	*-0.763*	*-0.979*	*4.874 ****	*4.857 ****
Year-of-transition dummies	yes	yes	yes	yes	yes	yes
Year-of-stabilization dummies		yes		yes		yes
INCpc89			0.008	0.008		
			2.356 **	*2.269 ***		
LnPOP					-3.054	-3.046
					-5.241 ***	*-5.193 ****
Number of observations	165	165	172	172	162	162
Adjusted R-squared	0.565	0.564	0.590	0.590	0.835	0.834

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Finally, while not included here, we find that the level of capital market development, while having a positive independent effect, does not uniformly seem to help COT. While this may at first seem odd, the reason is probably due to a large number of countervailing effects.[23]

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[23] We speculate that capital markets exacerbate other effects. For example, for high enough OBCA so that COT has a positive performance impact, higher CAP (our capital markets indicator) probably further strengthens the gain as more effective capital markets can better act upon OBCA-enhancing potential to improve firm performance from privatization; for lower OBCA so that COT leads to a performance loss, higher CAP probably worsens the loss.

6 "One size (policy) does *not* fit all"

One of the primary hypotheses underpinning our analysis is the influence of initial conditions, as reflected in our cluster typology, on transition paths. This hypothesis was embodied in all our regressions when we isolated policy effects from the initial conditions, as captured by the cluster-specific, fixed effect variables. We now evaluate the strength of our initial conditions hypothesis in two ways. First, we determine whether the cluster fixed effects are statistically different from each other with respect to performance over the transition period and, second, whether clusters have different degrees of responsiveness to policy change.

To compare whether there are statistically significant differences between pairs of clusters' fixed effects, we use regression "*b*" of Table 4 and apply an F-test. The table in annex 1 contains the results and strongly corroborates that initial conditions fixed effects across the clusters are significantly different statistically, generally at the 1-percent significance level. The exceptions that prove the rule are the pair, Western FSU-Baltics (not surprising given that the Baltics *were* in part of the (western) FSU at the start of transition) and the pair, EU Border States-Balkans (adjacent regions in Eastern Europe). These results indicate that the initial conditions differentiate performance among clusters and prevent us from rejecting the cluster approach.

The second test regarding the initial conditions – and the main topic of this section – is whether they also have an influence on a cluster's responsiveness to policy change. The possibility of this indirect effect was suggested in section 5 when we showed that the effect of COT on economic performance depends on the level of OBCA, which is different for each cluster (as illustrated in the OBCA reform trajectories of Figure 3).

To econometrically determine whether policies engender cluster-specific responses, we interact the cluster dummies in separate regressions with each policy variable and check for statistically significant differences. Cases where such differences exist may suggest that policy lessons learned for one cluster are not valid for another.

For the case of COT, our basic regression equation comes from

$$\text{PERF}_{i,t} \ = \ g_1 \, \text{COT}_{i,t} \ + \sum_k [g_{17k} \, \text{CLUST}(k)_{i,t} {}^* \text{COT}_{i,t}]$$

$$+ \ g_8 \, \text{OBCA}_{i,t} + \ g_{10} \, \text{CAP}_{i,t} \ + g_{11} \, \text{REFmK}_{i,t} \ + \dots + \gamma_{i,t} \qquad (6.1)$$

Analogous models may be specified for OBCA and REF. The regression results are shown in Table 9. Note that because of technical limitations, we did not include the cross term, CLUST*COT*OBCA, in these regressions.[24] We discuss below the implications of this exclusion when interpreting our results.

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[24] In particular, to include CLUST*COT*OBCA, we would have had to include an additional twelve terms, namely, CLUST*COT and CLUST*OBCA. Such a specification would have essentially led to separate regressions for each cluster. As a result, the loss of degrees of freedom would have greatly weakened the power of our hypothesis tests.

Table 9: Estimating the cluster-specific performance responses of COT, OBCA and REF.

Regression	a	b	c
Dependent Variable	IGDP	IGDP	IGDP
COT		-1.115 *-0.700*	-1.439 *-0.876*
EU Border * COT	3.148 *1.533*		
Balkans * COT	-0.670 *-0.203*		
Baltics * COT	6.632 *1.752 **		
Western FSU * COT	-8.850 *-3.428 ****		
Caucasus * COT	-1.888 *-0.548*		
Central Asia * COT	0.199 *0.077*		
OBCA	2.360 *1.745 **		1.715 *1.198*
EU Border * OBCA		5.170 *2.132 ***	
Balkans * OBCA		-6.861 *-1.845 **	
Baltics * OBCA		8.931 *2.013 ***	
Western FSU * OBCA		-3.279 *-1.416*	
Caucasus * OBCA		4.103 *1.554*	
Central Asia *OBCA		7.024 *2.653 ****	
REFmK	1.152 *0.577*	3.217 *1.569*	
CAP	4.712 *2.804 ****	2.945 *1.809 **	
EU Border * REF			8.582 *3.244 ****
Balkans * REF			-0.599 *-0.159*
Baltics * REF			8.652 *1.867 **
Western FSU * REF			0.757 *0.218*
Caucasus * REF			4.837 *0.861*
Central Asia * REF			4.129 *1.187*

Columns continued on next page.

Table 9: Estimating the cluster-specific performance responses of COT, OBCA and REF (continued).

Regression	a	b	c
Dependent Variable	*IGDP*	*IGDP*	*IGDP*
EU Border fixed effect	32.063	34.422	30.486
	8.534 ***	*6.515 ****	*6.734 ****
Balkan fixed effect	30.168	30.582	25.453
	5.718 ***	*4.930 ****	*4.487 ****
Baltic fixed effect	72.659	68.26	71.841
	15.482 ***	*11.126 ****	*13.272 ****
Western FSU fixed effect	1.540	6.706	4.809
	0.336	*1.159*	*0.930*
Caucasus fixed effect	-7.473	-2.102	-9.282
	-1.446	*-0.330*	*-1.557*
Central Asia fixed effect	18.903	25.083	16.707
	3.945 ***	*4.182 ****	*2.954 ****
Year of transition dummies	yes	yes	yes
Year of stabilization dummies	yes	yes	yes
Number of observations	173	173	173
Adjusted R-squared	0.767	0.739	0.716

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

In the case of COT (regression "*a*" of Table 9), we typically find that the performance response to a change in COT is positive for the Baltics and to a lesser extent for the EU Border States and is negative for the Western FSU. COT has no statistically significant impact on economic performance in the Balkans, the Caucasus, or Central Asia. Note that OBCA at the level of the full sample in these regressions retains a positive, statistically significant effect.

In the case of OBCA (regression "*b*" of Table 9), we also find that performance responses to policy changes vary by cluster. In particular, we find that the performance response to an increase in OBCA is positive for the EU Border States, the Baltics, and Central Asia. It is negative for the Balkans and Western FSU and positive but (just) insignificant for the Caucasus. Note that as in section 4, COT at the level of the full sample in this regression retains its lack of statistical significance as does CAP its statistically positive significance.

As shown in regression "*c*" of Table 9, applying a cluster interaction test to REF yields the same pattern of results: namely, a positive performance response for the EU Border States and the Baltics and no statistically significant response for the other clusters.

It is interesting to relate these results to the conclusions illustrated in Figure 9 and Table 6. There, in contrast to this section, we included a COT*OBCA cross term (to capture the fact that responsiveness to COT depends on the level of OBCA) but did not allow for cluster-specific responses to policy. Therefore, for interpreting regression "*a*" here, if we believe that the correct specification should include this COT*OBCA cross term, then the CLUST*COT terms must be capturing, among other cluster-specific responses, the COT policy responsiveness differences

due to each cluster's different average[25] level of OBCA. An analogous argument applies when interpreting the CLUST*OBCA terms of regression "*b*" of Table 9.

We find that the results of section 5 (where we argued that COT requires a minimum amount of OBCA in order to have a performance gain) and those here are broadly in line. Consider an example. Comparing Figure 9 and Table 6, we find that the average OBCA levels in the EU Border States and the Baltics exceed the critical value necessary for COT to have a positive policy impact. This positive impact of COT predicted for the EU Border States and the Baltics by Figure 9 and Table 6 is manifested by the positive coefficients of their cluster-COT interaction terms in regression "*a*" of Table 9. A similar argument holds for the negative coefficient of the Western FSU interaction term.

As in the case of cluster-specific COT policy impacts, the cluster-specific OBCA impact results are also broadly in line with the critical COT cut-off values of Figure 9. Here, however, we do find that we need to revise the conclusion of section 5 that OBCA reform can never hurt economic performance, as the *negative* coefficient for the Balkans-OBCA interaction term in regression "*b*" of Table 9 attests. The resolution of this apparent contradiction returns to the fact that our threshold calculations of section 5 were based on *average* policy responsiveness across the clusters. Had we been able to run regressions with a CLUST*COT*OBCA term, we would have likely found that, in the case of the Balkans, COT levels were below the threshold for OBCA to have a performance-improving effect. Intuitively, an explanation of the negative performance impact of OBCA may be that reforms that harden budgets but do not transfer control to private (and, therefore, profit-maximizing) owners may hurt economic performance.

In summary, the results of this section concerning the cluster-specific performance impact of COT and OBCA support our theme that "one size (policy) does *not* fit all". At the same time, there is reason to believe that much of the variation of performance responsiveness to policy among the clusters has been due to different levels of OBCA (or COT) and not from other "paradigm shift" differences.

7 Summary and conclusions

This paper is the third in a series for USAID that evaluates the first decade of economic reform in transition economies. Based on indicators developed in Sachs, Zinnes, and Eilat (2000, vol. 1), the present paper contributes to the already large literature on transition by seeking to clarify what factors contributed to the gains from privatization in transition economies over the past decade. In doing so, our goal is to point the way to a revised paradigm for privatization policy in transition economies.

We first summarize the paradigm debate and show how the issues of privatization play a central role. We find, as reflected in the original "Washington Consensus", that there has been a tendency to equate change-of-title (COT) with privatization, with the consequence of COT becoming *the* policy imperative. Based on a review of the literature on the gains from privatization, however, we identify the importance of additional factors, including institutions to address agency (incentive and contracting) issues, hardening budget constraints, market competitiveness (removal of entry barriers), and depolitization of firm objectives, as well as the implementation challenge of developing institutions and a regulatory framework to address them. In the present paper, we examine the empirical evidence across 24 countries to determine whether COT alone

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[25] The averages here are over the entire transition period.

has been sufficient to achieve economic performance gains or whether these other prerequisites found in the literature (which we refer to as "OBCA" reforms) are important.

We then introduce the key elements of our approach. These include the importance of initial conditions for economic performance, an initial conditions cluster typology of countries, and the significance of the transformational cycle of transition. For our econometric analysis below, we then introduce several indicators, which we developed in Sachs, Zinnes and Eilat (2000; vol. 1), to capture the degree of change of title, agency-related issues, the progress in other reforms, and alternative measures of economic performance.

We then proceed to examine econometrically the central concerns of the paper. We first show that privatization involving change-of-title alone is not enough to generate economic performance improvements. This result is robust to the several alternative measures of economic performance we utilize, including GDP recovery, foreign direct investment, and exports. We then introduce our indicators to capture the reforms directed at prudential regulation, corporate governance, hardening of enterprise budget constraints, management objectives, and developing capital markets. We show that, while these measures on their own contribute to economic performance improvements, the real gains to privatization come from complementing (combining) change-of-title reforms with OBCA reforms. As Pistor (1999b) underscores, it is only when the legal and regulatory institutions supporting ownership are in place and functioning that owners can exercise their prerogatives conferred by a change-of-title to pressure firms to improve their productivity and profitability. Only then will the economic performance of the country improve, too.

We go on to show that these results need to be qualified in two ways. The first relates to when we do not allow for cluster-specific performance responses to policy. Here we find that the higher the level of OBCA, the more positive the economic performance impact from an increase in COT privatization. In particular, where COT has a positive impact, the impact will be even more positive the higher is the level of OBCA; where COT has a negative impact, the impact will be *less* negative the higher is the level of OBCA.

A corollary to this result is that there is a threshold level (provided in the text) of OBCA in order for change-of-title privatization to have a *positive* economic performance response. Thus, if complementary OBCA reforms are not sufficiently developed, change-of-title privatization may have a *negative* performance impact. An explanation for the cases of worsening overall economic performance from COT privatization is that transfer of ownership without the institutional structures in place for owners to exercise their authority simply replaces poor government control of management with weak or no private sector control. We also find that the corollary's obverse is true: an improvement of OBCA does not guarantee economic performance improvements unless a minimum (threshold) level of change-of-title privatization has already been attained. An explanation for this may be that reforms that harden budgets but do not transfer control to private (and, therefore, profit-maximizing) owners may hurt economic performance. Our analysis shows that the threshold COT level for this worrying effect is quite low, with all the countries in the affected clusters well above it by the end of the decade. For both aspects of the corollary, the paper indicates the countries and years that did not exceed these thresholds.

The second qualification relates to when we allow for cluster-specific performance responses to policy changes (but do not allow for the policy synergy effects of the first qualification). We find that economic performance responses from COT privatization are sensitive to the cluster carrying out the policy. The economic performance response to change-of-title privatiza-

tion was in general significantly positive for the EU Border States and the Baltics, negative for the Western FSU, and ineffectual in the Balkans, the Caucasus, and Central Asia. Increases in OBCA led to performance improvements in the EU Border States, the Baltics, the Caucasus, and Central Asia and led to performance losses in the Western FSU and the Balkans. In short, "one size (policy) does *not* fit all"; privatization policies must be tailored to the (cluster-specific) level of complementary reforms in place.

This paper allows policy markers as well as donor technical assistance providers to draw two main recommendations: First and foremost, they should consider carefully when recommending quick privatization if the requisite OBCA-related, legal, and regulatory institutions are not in place and functioning. As already mentioned, our analysis suggests that there is reason to believe that countries in the Western FSU do not meet these conditions (with the Caucasus and Central Asia borderline). Economic performance gains come only from "deep" privatization, i.e., where change-of-title reforms occur in the presence of high enough levels of OBCA. Second, the idea of "one size fits all", at least from the policy perspective, does *not* apply to transition countries. As a result of their different initial conditions, the economic performance responses of countries to the *same* policies are different. In the area of privatization, these responses depend on the level of complementary reforms – and on OBCA-related reforms in particular. Policy prescriptions, therefore, should be less ideological and more tailored to the country's institutional conditions and stage of transition.

We close by cautioning that our results are hardly definitive. While we have made every effort to use the latest and best data – including a 25-country survey especially conducted for this purpose – the amount of structural change occurring is enormous, the number of observations too few, and the data still too noisy to claim unconditional success. Nevertheless, given that the results are in line with those predicted by agency theory and given that we have utilized a number of alternative economic performance measures and a variety of econometric specifications, we feel that future investigations will broadly support our central conclusions. A new privatization paradigm has emerged: "While ownership matters, institutions matter just as much".

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Annexes

Annex 1: The statistical significance of the differences between the clusters.
(See notes at the end of the tables.)

Cluster fixed effects*

	EU Border	Balkans	Baltics	Western FSU	Caucasus	Central Asia
EU Border						
Balkans	-					
Baltics	<1	<1				
Western FSU	<1	<1	-			
Caucasus	<1	<1	<10	<1		
Central Asia	<1	<1	<1	<1	<1	

Source: Authors' calculations based on F-tests using regression b in Table 4.

Cluster-specific policy impacts for COT*

	EU Border	Balkans	Baltics	Western FSU	Caucasus	Central Asia
EU Border						
Balkans	-					
Baltics	-	-				
Western FSU	<1	<5	<1			
Caucasus	-	-	<10	<10		
Central Asia	-	-	-	<1	-	

Source: Authors' calculations based on F-tests using regression a in Table 9.

Cluster-specific policy impacts for OBCA*

	EU Border	Balkans	Baltics	Western FSU	Caucasus	Central Asia
EU Border						
Balkans	<1					
Baltics	-	<1				
Western FSU	<1	-	<5			
Caucasus	-	<5	-	<5		
Central Asia	-	<1	-	<1	-	

Source: Authors' calculations based on F-tests using regression b in Table 9.

Cluster-specific policy impacts for REF*

	EU Border	Balkans	Baltics	Western FSU	Caucasus	Central Asia
EU Border						
Balkans	<1					
Baltics	-	<10				
Western FSU	<5	-	-			
Caucasus	-	-	-	-		
Central Asia	-	-	-	-	-	

Source: Authors' calculations based on F-tests using regression c in Table 9.

*The numbers in the table represent the p-value in percent in which the no-difference-between-respective-clusters hypothesis can be statistically rejected. A hyphen implies that the two respective clusters are not statistically different at at least the 90-percent level of confidence.

Annex 2: Description of abbreviations, data, and symbols used

Country codes

ALB – Albania, ARM – Armenia, AZE – Azerbaijan, BGR - Bulgaria, BLR – Belarus, CZE – Czech Republic, EST – Estonia, GEO – Georgia, HUN – Hungary, HRV – Croatia, KAZ – Kazakhstan, KGZ – Kyrgyz Republic, LVA – Latvia, LTU – Lithuania, MDA - Moldova, MKD – Macedonia, POL – Poland, ROM – Romania, RUS - Russia, SVK - Slovakia, SVN – Slovenia, TJK – Tajikistan, TKM – Turkmenistan, UKR – Ukraine, UZB – Uzbekistan

Other Abbreviations

CEE – Central and Eastern Europe
EBRD – European Bank for Reconstruction and Development
FSU – Former Soviet Union
USAID – United States Agency for International Development
na - data not available

Cluster numbers in graphs

1. EU Border: Croatia, Czech Republic, Hungary, Poland, Slovakia, Slovenia,
2. The Balkans: Bulgaria, Macedonia, Romania
3. The Baltics: Estonia, Latvia, Lithuania
4. Albania (not included in this paper)
5. Western FSU: Belarus, Russia, Moldova, Ukraine
6. The Caucasus: Armenia, Azerbaijan, Georgia
7. Central Asia: Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan

Symbols for intra-cluster graphs

Hollow square: average of the cluster for 1998
Horizontal line: average of the entire sample for 1998

Year transition began

1990: Bulgaria, Czech Republic, Hungary, Poland, Romania, Slovakia
1991: Albania, Croatia, Macedonia, Slovenia
1992: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyz Republic, Lithuania, Latvia, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

Missing data in graphs

The graphs for the cluster trajectories (*but not the regressions*) are missing the following observations:

Cluster 1: transition year 9 (since observations for Croatia and Slovenia are missing), years 1
Cluster 2: transition years 1 and 9 (since Macedonia gained independence only in its second year of transition)

Annex 2 Description of abbreviations, data, and symbols used (continued)

Table 10: List of variables' definitions, sources, and missing data.

Variable	Description	Units	Source	Exclusions
COT	Change of title indicator	mean 0, variance 1	Sachs, Zinnes and Eilat (2000; vol. 1)	Macedonia: 1992-5
OBCA	Indicator for degree "agency" issues under control, including management objective function, hardness of budget constraint, ability of owners to control and monitor management	mean 0, variance 1	Sachs, Zinnes and Eilat (2000; vol. 1)	Ukraine, Armenia: 1992; Georgia, Tajikistan: 1992-3
REF	Indicator of progress in reforms, including tax, price/wage liberalization, social safety net, capital markets, banking	mean 0, variance 1	Sachs, Zinnes and Eilat (2000; vol. 1)	
REFmK	Same as REF, but without the capital markets	mean 0, variance 1	Sachs, Zinnes and Eilat (2000; vol. 1)	
CAP	Indicator of capital markets development	mean 0, variance 1	Sachs, Zinnes and Eilat (2000; vol. 1)	
IGDP	Index of real GDP	1989=100	EBRD (1999)	
FDIpop	FDI in 1995 US$ / population	1995 US$	EBRD (1999)	
FDIrel	FDI in 1995 US$ / "ppp"-adjusted income in 1989	Percent	EBRD (1999) and de Melo et. al. (1995), IMF (1999)	Azerbaijan all years
EXPrel	Exports (from balance of payments) in 1995 US$ / "ppp"-adjusted income in 1989.		WDI (1999) and de Melo et. al. (1995)	Bulgaria, Czech Republic, Hungary, Poland: 1990; Russia, Slovakia: 1992-3; Romania: 1991; Tajikistan, Turkmenistan, Uzbekistan: 1992
INCpc89	National income per capita in 1989 at purchasing-power parity	1989 US$	de Melo et. al. (1995)	
LnPOP	Log of population	Number	EBRD (1999)	

Annex 2 Description of abbreviations, data, and symbols used (continued).

Table 10: List of variables' definitions, sources, and missing data. (continued)

Variable	Description	Units	Source	Exclusions
CLUST1	EU Border fixed effect (Croatia, Czech Republic, Hungary, Poland, , Slovakia, Slovenia)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
CLUST2	Balkan fixed effect (Bulgaria, Macedonia, Romania)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
CLUST3	Baltic fixed effect (Estonia, Latvia, Lithuania)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
CLUST5	Western FSU fixed effect (Moldova, Russia, Ukraine)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
CLUST6	Caucasus fixed effect (Armenia, Azerbaijan, Georgia)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
CLUST7	Central Asia fixed effect (Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan)	0 or 1	Derived from Sachs, Zinnes and Eilat (2000; vol. 1)	
TrYEAR2	Year 2 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR3	Year 3 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR4	Year 4 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR5	Year 5 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR6	Year 6 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR7	Year 7 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR8	Year 8 of transition dummy	0 or 1	Derived from EBRD (1999)	
TrYEAR9	Year 9 of transition dummy	0 or 1	Derived from EBRD (1999)	
STAB1	Year 1-2 of macro stabilization dummy	0 or 1	Derived from EBRD (1999)	
STAB2	Year 3-5 of macro stabilization dummy	0 or 1	Derived from EBRD (1999)	
STAB3	After year 5 of macro stabilization dummy	0 or 1	Derived from EBRD (1999)	

Annex 2: List of variables' definitions, sources, and missing data (continued)

Table 11: "Recipe" for constructing the COT and OBCA indicators

Category	Definition	Effect	Weight	Scoring	Availability*	Source
Enterprise privatization (COT: Change Of Title)	Indicator	Pos		M0V1	0-8	Computed
	Large-scale privatization index	Pos	0.2	1 to 4.33 (1 worst)	4-8	EBRD('94-99)
	Small-scale privatization index	Pos	0.2	1 to 4.33 (1 worst)	4-8	EBRD('94-99
	Percentage of small firms privatized	Pos	0.2	Percent	0-8	Survey, WB
	Private sector employment share	Pos	0.2	Percent	0-7	EBRD, WB
	Private sector GDP share	Pos	0.2	Percent	0-8	EBRD('94-99)
OBCA (Privatization performance incentives)	Indicator	Pos		M0V1	0-8	Computed
Budget constraint	Indicator	Pos	0.4	M0V1	0-7	Computed
	Tax arrears / average GDP	Neg	0.2	Percent	0-6	WB, EBRD
	Budget subsidies / average GDP	Neg	0.3	Percent	1-7	EBRD
	Bad loans / Total loans	Neg	0.2	Percent	0-8	EBRD('94-99)
	Electricity tariff collection ratio	Pos	0.1	Percent	4-7	EBRD('94-99)
	Likelihood of mid-sized private firm being bailed out	Neg	0.2	0=very unlikely to 4=very likely	0-8	Survey
Agency problems/man-agement objectives	Indicator	Pos	0.6	M0V1	4-8	Computed
	Existence of bankruptcy courts	Pos	0.1	1=Yes, 0=No	0-8	Survey
	Governance/restructuring index	Pos	0.6	1 to 4.33 (1 worst)	4-8	EBRD('94-99)
	Legal system for investment index	Pos	0.3	1 to 4.33 (1 worst)	5-8	EBRD('94-99)

Explanatory notes: This table provides the "recipe" for the two indicators "change of title" and OBCA. The latter comprises the sub-indicators, "budget" and "agency/objectives". In order to interpret the sub-indicator tables, first note that all the categories and sub-categories of the table have weights listed in the column "Weight" and the direction of the impact of the variable on reform progress listed in the column "Effect". These comprise hierarchical levels. For a given level the weights add up to unity (1). For example, in the OBCA indicator, the weights for (hardness of) "Budget constraint" (0.4) and "Agency problems/management objectives" (0.6) add to 1, as do the weights of the five and three variables used within each of these two sub-categories.

Abbreviation	Definition	Abbreviation	Definition
*	The years of data availability (e.g., "2" is 1992).	Survey	HIID Competitiveness in Transition Survey of Foreign Institutes
M0V1	Mean zero, variance 1	WB	World Bank Enterprise Reform and Privatization Database

Annex 3: Transition year and macro stabilization fixed effect coefficients from selected regressions

Regressions from Table 3:

Regression	a	b	c	d	e	f
Dependent Variable	GDPrel	GDPrel	GDPrel	GDPrel	GDPrel	GDPrel
Year 2 of transition effect	-12.942	-11.305	9.908	9.820	-16.031	-12.644
	-3.454 ***	-3.054 ***	1.309	1.296	-5.559 ***	-3.414 ***
Year 3 of transition effect	-21.115	-19.263	1.216	1.117	-18.171	-20.833
	-5.210 ***	-4.820 ***	0.172	0.158	-5.808 ***	-5.202 ***
Year 4 of transition effect	-24.523	-20.490	-1.974	-2.775	-16.589	-24.332
	-5.389 ***	-4.336 ***	-0.3	-0.424	-4.63 ***	-5.413 ***
Year 5 of transition effect	-25.185	-20.841	-3.454	-4.033	-15.449	-25.027
	-5.040 ***	-4.049 ***	-0.566	-0.663	-3.908 ***	-5.071 ***
Year 6 of transition effect	-24.037	-21.844	-2.996	-3.335	-14.193	-23.945
	-4.489 ***	-3.783 ***	-0.516	-0.574	-3.362 ***	-4.528 ***
Year 7 of transition effect	-23.161	-22.568	-2.957	-2.869	-13.974	-23.054
	-4.112 ***	-3.675 ***	-0.524	-0.508	-3.166 ***	-4.145 ***
Year 8 of transition effect	-19.851	-21.046	-0.807	-0.597	-13.608	-19.785
	-2.790 ***	-2.833 ***	-0.133	-0.098	-2.488 ***	-2.815 ***
Year 9 of transition effect	-18.700	-20.994			-12.843	-18.458
	-2.289 **	-2.489 ***			-2.052 **	-2.288 **
Macro stabilization yrs 1, 2		-6.196				
		-1.969 **				
Macro stabilization yrs 3 - 5		-3.872				
		-0.825				
Macro stabilization yrs > 5		3.759				
		0.539				

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Regressions from Table 3 (continued):

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
Year 2 of transition effect	0.642	0.147	1.869	0.766	1.682	2.173
	0.276	*0.630*	*0.119*	*0.486*	*0.740*	*0.957*
Year 3 of transition effect	0.133	0.205	6.662	11.476	2.218	2.957
	0.524	*0.809*	*0.392*	*0.677*	*0.924*	*1.234*
Year 4 of transition effect	0.160	0.255	7.026	12.881	3.528	5.106
	0.565	*0.866*	*0.370*	*0.648*	*1.324*	*1.838 **
Year 5 of transition effect	0.036	0.147	0.874	7.933	4.788	6.496
	0.116	*0.457*	*0.042*	*0.367*	*1.643 **	*2.153 ***
Year 6 of transition effect	0.462	0.411	31.245	26.198	6.025	7.149
	1.396	*1.153*	*1.403*	*1.084*	*1.938 **	*2.152 ***
Year 7 of transition effect	0.359	0.210	23.716	11.928	6.109	6.565
	1.037	*0.557*	*1.013*	*0.465*	*1.875 **	*1.870 **
Year 8 of transition effect	0.508	0.299	21.851	5.510	9.855	9.545
	1.171	*0.655*	*0.740*	*0.177*	*2.462 ***	*2.283 ***
Year 9 of transition effect	0.367	0.110	10.929	-8.801	10.332	9.564
	0.739	*0.213*	*0.323*	*-0.249*	*2.290 ***	*2.043 ***
Macro stabilization yrs 1, 2		-0.098		-4.352		-1.946
		-0.499		*-0.328*		*-1.158*
Macro stabilization yrs 3 - 5		0.116		11.681		-1.937
		0.402		*0.590*		*-0.794*
Macro stabilization yrs > 5		0.582		46.141		1.438
		1.356		*1.567*		*0.400*

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Regressions from Table 4:

Regression	a	b	c	d	e	f
Dependent Variable	IGDP	IGDP	IGDP	IGDP	IGDP	IGDP
Year 2 of transition effect	-11.943	-10.736	12.645	62.699	-18.958	-11.954
	-3.042 ***	*-2.785 ****	*1.678 **	*15.801 ****	*-6.911 ****	*-3.061 ****
Year 3 of transition effect	-20.127	-19.262	3.439	53.775	-20.099	-20.218
	-4.614 ***	*-4.515 ****	*0.473*	*13.543 ****	*-6.721 ****	*-4.660 ****
Year 4 of transition effect	-23.459	-20.547	1.811	50.945	-18.214	-23.680
	-4.883 ***	*-4.200 ****	*0.266*	*12.074 ****	*-5.492 ****	*-4.955 ****
Year 5 of transition effect	-25.590	-22.226	-0.669	48.773	-17.871	-25.690
	-5.024 ***	*-4.287 ****	*-0.108*	*10.620 ****	*-5.049 ****	*-5.072 ****
Year 6 of transition effect	-25.387	-24.092	-2.225	47.745	-17.086	-25.401
	-4.644 ***	*-4.103 ****	*-0.375*	*9.737 ****	*-4.497 ****	*-4.672 ****
Year 7 of transition effect	-24.492	-24.601	-2.170	48.421	-17.082	-24.502
	-4.266 ***	*-3.941 ****	*-0.374*	*9.311 ****	*-4.298 ****	*-4.292 ****
Year 8 of transition effect	-22.102	-23.512	-0.547	50.177	-17.648	-22.020
	-3.115 ***	*-3.170 ****	*-0.090*	*7.340 ****	*-3.620 ****	*-3.121 ****
Year 9 of transition effect	-23.768	-25.692		50.251	-18.861	-23.255
	-2.960 ***	*-3.091 ****		*6.384 ****	*-3.420 ****	*-2.911 ****
Macro stabilization yrs 1, 2		-6.889				
		-2.179 **				
Macro stabilization yrs 3 - 5		-3.506				
		-0.748				
Macro stabilization yrs > 5		2.828				
		0.686				

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
Year 2 of transition effect	0.241	0.293	12.213	16.219	2.277	2.727
	0.941	*1.141*	*0.712*	*0.944*	*0.929*	*1.113*
Year 3 of transition effect	0.376	0.393	21.693	23.230	2.819	3.457
	1.306	*1.368*	*1.135*	*1.221*	*1.061*	*1.303*
Year 4 of transition effect	0.431	0.444	23.010	24.106	4.051	5.583
	1.365	*1.373*	*1.098*	*1.119*	*1.397*	*1.850 **
Year 5 of transition effect	0.239	0.269	12.527	15.008	5.220	6.876
	0.721	*0.792*	*0.567*	*0.659*	*1.684 **	*2.146 ***
Year 6 of transition effect	0.624	0.503	40.754	31.496	6.435	7.604
	1.762 *	*1.319*	*1.720 **	*1.228*	*1.942 ***	*2.150 ***
Year 7 of transition effect	0.526	0.322	33.718	18.549	6.494	7.035
	1.421	*0.797*	*1.356*	*0.681*	*1.868 **	*1.879 **
Year 8 of transition effect	0.627	0.389	28.377	10.435	10.143	9.942
	1.388	*0.816*	*0.927*	*0.322*	*2.418 ***	*2.264 ***
Year 9 of transition effect	0.351	0.090	8.500	-11.347	10.493	9.838
	0.694	*0.168*	*0.246*	*-0.313*	*2.258 ***	*2.039 ***
Macro stabilization yrs 1, 2		-0.053		-2.295		-2.080
		-0.259		*-0.165*		*-1.199*
Macro stabilization yrs 3 - 5		0.191		15.948		-2.216
		0.635		*0.775*		*-0.886*
Macro stabilization yrs > 5		0.578		45.747		0.947
		1.316		*1.520*		*0.256*

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.

Regressions from Table 5:

Regression	a	b	e	f
Dependent Variable	IGDP	IGDP	IGDP	IGDP
Year 2 of transition effect	-13.167	-11.884	-19.358	-12.966
	-3.424 ***	*-3.096 ****	*-7.180 ****	*-3.412 ****
Year 3 of transition effect	-21.942	-20.820	-20.826	-21.812
	-5.086 ***	*-4.845 ****	*-6.990 ****	*-5.117 ****
Year 4 of transition effect	-24.874	-22.337	-18.796	-24.839
	-5.216 ***	*-4.504 ****	*-5.655 ****	*-5.273 ****
Year 5 of transition effect	-27.648	-24.407	-18.806	-27.589
	-5.425 ***	*-4.575 ****	*-5.250 ****	*-5.479 ****
Year 6 of transition effect	-26.981	-25.579	-17.876	-26.995
	-4.927 ***	*-4.274 ****	*-4.651 ****	*-4.990 ****
Year 7 of transition effect	-26.927	-26.447	-18.233	-26.927
	-4.663 ***	*-4.150 ****	*-4.512 ****	*-4.720 ****
Year 8 of transition effect	-25.436	-25.619	-19.201	-25.443
	-3.562 ***	*-3.388 ****	*-3.878 ****	*-3.607 ****
Year 9 of transition effect	-31.264	-30.238	-22.338	-30.942
	-3.716 ***	*-3.421 ****	*-3.820 ****	*-3.722 ****
Macro stabilization yrs 1, 2		-5.573		
		-1.682 *		
Macro stabilization yrs 3 - 5		-2.619		
		-0.548		
Macro stabilization yrs > 5		2.884		
		0.421		

Regression	g	h	i	j	k	l
Dependent Variable	FDIrel	FDIrel	FDIpop	FDIpop	EXPrel	EXPrel
Year 2 of transition effect	0.174	0.226	8.620	12.212	2.065	2.406
	0.686	*0.882*	*0.512*	*0.719*	*0.856*	*0.984*
Year 3 of transition effect	0.287	0.312	16.280	17.777	2.581	3.030
	0.996	*1.076*	*0.858*	*0.933*	*0.987*	*1.141*
Year 4 of transition effect	0.349	0.349	19.254	17.694	4.270	5.071
	1.104	*1.064*	*0.923*	*0.815*	*1.497*	*1.678 **
Year 5 of transition effect	0.132	0.154	6.371	6.210	4.954	5.992
	0.392	*0.439*	*0.287*	*0.267*	*1.624*	*1.850 **
Year 6 of transition effect	0.544	0.428	35.771	24.914	6.013	6.641
	1.511	*1.097*	*1.502*	*0.959*	*1.843 **	*1.858 **
Year 7 of transition effect	0.410	0.229	25.927	10.662	5.799	6.016
	1.085	*0.552*	*1.032*	*0.386*	*1.691 **	*1.590*
Year 8 of transition effect	0.475	0.280	17.232	1.131	8.836	8.719
	1.031	*0.573*	*0.557*	*0.034*	*2.124 ***	*1.963 ***
Year 9 of transition effect	0.031	-0.148	-17.137	-32.693	7.014	7.193
	0.057	*-0.261*	*-0.472*	*-0.854*	*1.465*	*1.411*
Macro stabilization yrs 1, 2		0.017		5.134		-1.029
		0.077		*0.355*		*-0.555*
Macro stabilization yrs 3 - 5		0.236		22.232		-0.982
		0.769		*1.067*		*-0.376*
Macro stabilization yrs > 5		0.581		46.954		1.526
		1.322		*1.571*		*0.412*

See Annex 2 for variable definitions and sources. The number below the coefficient is the t-statistic. *=10-percent significant, **=5-percent significant; ***=1-percent significant.